COAL AGE

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The Day of New Ideals

By Floyd W. Parsons

BOLSHEVISM will not prevail in the world for the reason that it will not be successful for those who are advocating it. What a man gets by force will eventually be taken away from him by someone else who is stronger. The bitter opponent of all mobs of industrial shirkers that become active in the United States from time to time will not be the capitalist, but the American workman himself. The other day in Washington I was talking to a great labor leader, and he was emphatic in the statement that "an autocracy of labor is as bad as an autocracy of capital."

The average workingman in this country is the most intelligent employee in the world. He is fully aware that our social system is not perfect, but he knows that such alterations in our laws as are demanded by the changing times can be brought about by methods that do not include rapine, bloodshed and incendiarism. He also has learned that in this great Nation a majority of those who have reached prosperity began life in humble circumstances. Among us there are a few so-called "lucky" men who have achieved wealth without labor, but as a general rule those among us who succeed do so through intense application and never-ceasing industry.

The lessons of the war plainly indicate the commencement of a new era throughout the world. Although we are fortunate to live in a country where the new order of things will be inaugurated in a sane and peaceful fashion, this does not mean that the parties to industry can act with indifference toward the necessities of the times. Labor in America has proved to capital that it stands as a barrier between destructive radicalism and a rule of law. Employers who have not seen this and do not appreciate the fact will lose out in the coming days, because they still stand as representatives of a system in business that can no longer succeed.

There is no doubt that betterment work, profit-sharing, bonus payments and stock ownership are splendid ways to hold the interest of the worker and to share the fruits of business with him. But all of these plans fail to give the employee the thing he desires most, and that is an opportunity to fully express his individuality. No industrial scheme will ever operate with complete success unless it creates in the workman the same sort of interest that he would have if working for himself. Old ideals are no more, and old conditions will no longer be accepted without question.

The real labor problems of the future will not be so concerned about wages and hours as has been the case in the past. Large labor turnovers will be remedied with something besides dollars. High costs will more often be properly attributed to low production, and the latter will be found to result from an uninterested working force. It has been demonstrated time and again that the output of a plant can often be increased 50 per cent. by some simple adjustment that removes the cause of general unhappiness on the part of a company's employees.

On the other hand, there should be no confusing of charity and business. No self-respecting man desires to have his life ordered for him. Those corporations that will be most successful in the future will be the ones where wise managements have imbued the men with a spirit somewhat akin to the feeling that, in the past, nourished only the owners of many establishments.

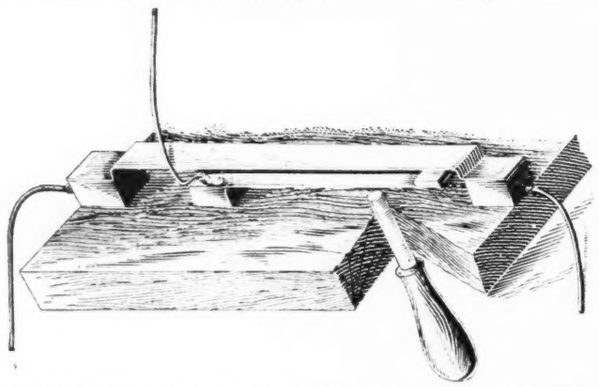
The cause of the failure of radicalism in America is identical with the cause of the failure of nineteenth-century conservatism. In both cases the workman is deprived of incentive by a system that holds forth no reward and thus kills individual initiative. Of course, any employer is free to fight the present desire of workmen for recognition, but the farsighted boss today will secure for his business all the brains and energy of his men by hitching up with them and pulling in double harness. Such managements are the only ones that can survive.

IDEAS AND SUGGESTIONS

Homemade Signal-Light Switch

BY JOSEPH POWER
Ziegler, Ill.

The illustration shows a switch for signal lights that may be made readily in the average mine shop. The drawing is practically self-explanatory and needs little comment. In operation the plug is pushed in until contact is made with the copper sheet, breaking contact with the line to the red light. This extinguishes the



EASILY CONSTRUCTED SWITCH FOR SIGNAL LIGHTS

red light and lights the green one. A release or withdrawal of the wooden plug extinguishes the green light and relights the red light.

This device may be advantageously built on sections of 1-in. plank, when and in the quantity needed. With such planks a switch of this kind can usually be built in from ½ to ¾ hour each. The chief materials are copper sheets and nails.

Reinforced Concrete Used as Props in English Coal Mines

Shortage of timber in England is largely responsible for the recent introduction of reinforced-concrete props in the coal mines of that country. But for this shortage it might have been many years before this form of prop would have been regarded as established, and this despite the fact that reinforced concrete has been employed for most other forms of construction and has been extensively adopted by the collieries. The scanty use which hitherto has been made of concrete props is not due to apathy on the part of the colliery manager, says the *Engineering World*, nor yet to his failure to appreciate their possibilities. In the first place there has been a disinclination to use anything other than timber on account of the extra weight involved in handling concrete props. Then there is the question of cost, which in the pre-war days was wholly unfavorable to concrete as compared with timber. That, however, is merely a question of initial outlay and can in no sense be regarded as a fair comparison, which would only be possible by considering the maintenance costs of a given length of roadway of concrete and timber props for a certain length of time.

All other conditions being equal, there is little reason to doubt that the concrete prop would prove the better investment, especially in districts tending to bring about either dry or wet rot. Also with concrete props a better roadway can be maintained than would be the case with timber, which has an important bearing upon the matter of ventilation. An objection raised against the concrete prop is that, unlike timber, it gives no warning but collapses suddenly when the breaking strain is reached; this, however, is disputed in the event a proper reinforcing and suitable concrete is used.

Up to this time practically all the concrete props used in England have been made at the collieries where they were installed; in some instances they have been made remarkably well considering the available facilities for their construction. In some cases, however, the reinforcement has been of the makeshift order; and owing to the method used in filling the molds, there has not been the necessary intimate relation between the concrete and the reinforcement which is an indispensable condition of success. To counteract the resulting weakness of improperly designed props, they are frequently made far heavier than necessary. As a result of numerous tests on various types of concrete props, the design has been much improved and props are now being manufactured in standard sizes and placed on the market.

New Method of Gas Detection

BY E. P. BRENNAN
Thomas, W. Va.

In mines where the ordinary flame type of safety lamp is the only means used for the detection of explosive gas, many dangerous conditions have often existed and many unaccountable accidents occurred. Especially is this so in open-light mines where the failure to detect gas is sure to lead to disaster. The firebosses and other mine officials are unable to detect deposits of methane when these are in thin layers near the roof. Very often the inability to detect gas is not due to the incompetency of firebosses or other officials, but to the construction of the lamp used in testing.

In nearly all ordinary safety lamps approved for mine use, the air containing the oxygen necessary for combustion enters either below the flame or over the glass cylinder, and so a little above the flame; and as this is at a point varying from 6 to 10 in. below the top of the lamp, there is always a possibility of thin layers of gas remaining undetected.

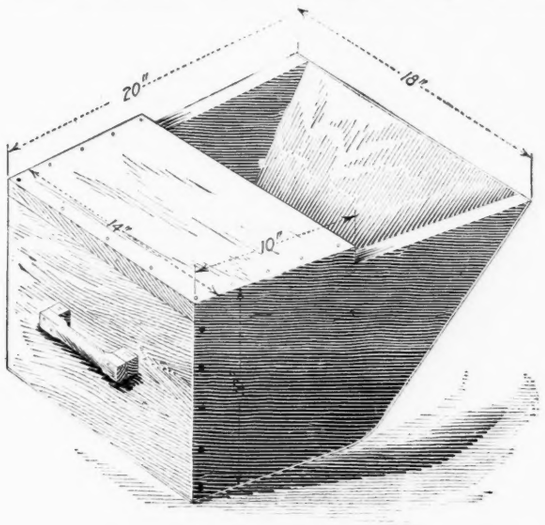
I have overcome this difficulty by using an ordinary bulb syringe, which is a small, soft-rubber ball with a hard-rubber tube attached. With this syringe an air sample can be secured from any desired place even though that place may be entirely inaccessible to the safety lamp. The sample is then forced slowly onto the flame of the lamp through the proper channels, and methane, if present, is detected in the usual way.

No one should experience any trouble in securing and testing a sample. The operation is very simple, as will be seen from the following description: Squeeze the soft-rubber ball tightly with one hand. This forces out the air. Then hold the nozzle of the syringe at the place where the test is to be made. Release the pressure of the hand and allow the ball to resume its normal shape. This draws in a sample of the mine air through the hard-rubber tube. Hold the tube in a downward position to retain the sample in the ball, then place the end of the tube under the intake ring of the lamp and force the sample onto the flame by squeezing the ball.—*Our Own People, a monthly publication of the Davis Coal and Coke Co.*

Water Scuttle or Bucket

By W. H. Luxton
Linton, Ind.

Efficient methods of performing any kind of work or labor ought to be encouraged so far as possible. The accompanying illustration shows a water scuttle or bucket that is so constructed as to gather thin sheets of water and do away with the present method of bailing it—namely, lifting it into a powder keg with an old coal shovel and then dumping the keg's contents



WATER SCUTTLE THAT DOES AWAY WITH THE NECESSITY OF BAILING

into a water box. The latter is a costly method as it is decidedly slow.

The sides, part of the top and the rear end of the scoop, to which the handle is attached, are made of 1 x 10-in. lumber. The bottom is of thin sheet iron or block tin, with holes punched as shown for nailing purposes. The scoop is of convenient shape to scoop up shallow water. Both hands get a suitable hold, similar to that in which a miner would utilize a shovel. One hand takes hold of the cross-piece, or cover, while the other grasps the handle.

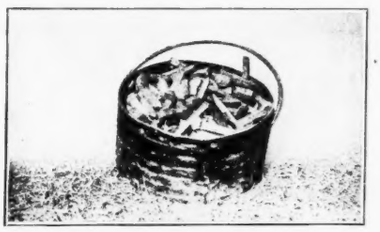
Since employees are liable to cut their hands when using powder kegs, and such cuts sometimes prove serious, safety of operation ought to be an incentive to the use of the scuttle here described. It can be constructed readily in mine shops or elsewhere at small expense.

Handy Spike Carrier

By S. D. Hainley
Osceola Mills, Penn.

In my travels from mine to mine I have noticed the different receptacles that tracklayers and daymen use for carrying spikes, nails and similar articles. Most of them employ an old dinner pail, kettle or something of the sort that can be picked up around town.

The best receptacle of this kind that I have yet seen, considering cost, durability, convenience and safety, was



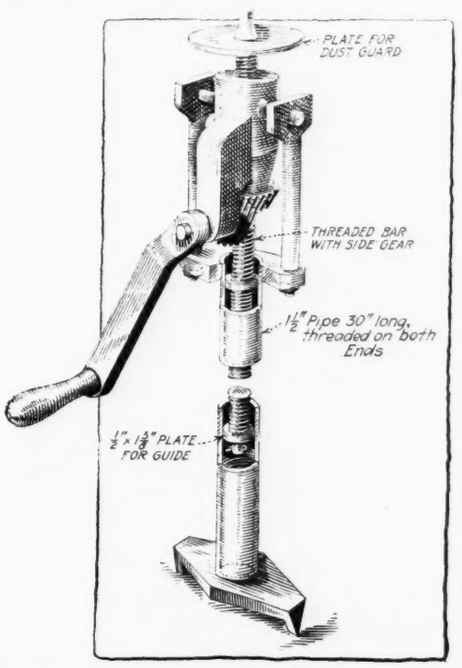
SIMPLIFIES CARRYING OF SPIKES

one made out of a powder can (25-lb. keg), cut in two through the middle, with the rough edge belled down on the inside. Thus, in reaching for a spike or nail there will be no danger of cutting the hand. Two holes are then punched—a 20d nail will do for a punch—on opposite sides, for a bail, which can be made out of an old bond or almost anything that makes the completed pail easy to handle.

Portable Mine Drill

By W. A. Jones
Sturgis, Ky.

A roof drill that has been found useful and satisfactory is shown below. The machine is simple and light, yet is strong in construction. The drill may be



SIMPLE HOMEMADE MINE DRILL

easily and quickly transported about the mine and set up rapidly where needed. Any ordinary mine blacksmith ought to be able to build this drill.

The Future of Peat as a Fuel—I

By J. B. C. Kershaw
Colwyn Bay, North Wales

SYNOPSIS—*Peat is probably more widely distributed throughout the world than were the original beds of coal-forming materials. Many attempts have been made to utilize this low-grade fuel. Although after the sods, or "turves," are air-dried they are extensively employed in certain localities for domestic purposes, the more ambitious attempts at the use of peat for power generation employ a briquetting process of some sort.*

NEXT to coal, peat is the most widely distributed naturally occurring solid fuel. In fact, if one considers only the area covered by the peat deposits of the world, without relation to their depth or thickness, it is probably true that the deposits of peat now occupy a larger area of the earth's surface than was occupied by the lower-lying coal measures in the earlier stages of geological history. The figures given hereafter enable one to form some idea of the enormous extent of the area covered by the peat bogs in all countries situated in the northern temperate zone. The occurrence of peat in temperate regions is explained only by the fact that the plant growths that produce peat require a moist but cool atmosphere and habitat for their development. This is never found nearer to the equator than 45 deg., nor does it occur within the frigid zone. Peat is found in abundance in the United States, Great Britain and Ireland, Denmark, France, Germany, Hanover, Holland, Hungary, Italy, Oldenburg, Russia, Bavaria and Sweden. As regards area and extent, the peat bogs of what were up to a few years ago the "crown lands" of Russia, are reported to contain 100,000,000 cu.ft. of excellent peat. The Swedish bogs are estimated to represent 3,000,000,000 tons, while the swamp regions of Virginia cover nearly 1000 square miles and have an average depth of 15 ft. In Germany the peat bogs cover 11,580 square miles, and in Ireland one-tenth of the surface of the whole country. The depth of the Irish bogs varies from 16 to 23 ft., but in certain cases this depth is much exceeded and some are known to have a depth of 50 ft. Finally, in the United Kingdom, which is liberally provided with coal measures, there are, according to Perkin, 6,000,000 acres of peat bog, with an average depth of 12 feet.

All the nations of the world, therefore, whose industrial activity and prosperity in the past have been based on the development of their deposits of coal, are well provided with this alternative source of heat and power.

The question of the best methods of utilizing their resources of peat is one of the highest importance for the leading manufacturing countries of the world. As their reserves of coal become exhausted, and the cost of working them increases, it will be necessary to fall back upon peat in order to be able to compete in the world's markets with countries such as Switzerland, Norway and Sweden, which possess immense water-powers capable of cheap development for industrial purposes.

This change from coal to peat is already occurring in certain European countries where coal is not plentiful or is of poor quality. And the change, no doubt, will be accelerated by the results of the recent war, which has already doubled the cost of coal mining, and consequently the price of coal, in nearly all the countries of the world.

Peat is a mass of decaying vegetable matter which under suitable natural conditions and with the lapse of time might be converted into a form of coal. The peat bogs to which reference has been made in the foregoing paragraphs may therefore be regarded as composed of a partially formed solid fuel that comes under the classification of "low-grade" fuel, owing to its high percentage of moisture.

FIG. 1. CUTTING PEAT FROM A LARGE BOG IN DUMFRIESSHIRE, SCOTLAND

If heat and great pressure were applied to this mass of decaying vegetable matter and the water were eliminated, a residue would probably remain that would possess many of the characteristics of coal. This conversion of vegetable remains into peat occurs only in swampy districts, because the water shuts off the decaying plant from the action of oxygen or air, and the decomposition that occurs is due, not to oxidation, but to internal changes which may be represented by the following chemical equation:

$$6C_6H_{10}O_5 = 7CO_2 + 3CH_4 + 14H_2O + C_{26}H_{20}O_2$$

Cellulose thus yields carbonic-acid gas, marsh gas, water and peat. The molecule of peat is therefore more complex in structure than that of cellulose. It is represented by 26 atoms of carbon with 20 of hydrogen and 2 of oxygen. Its molecular weight consequently is 364.

The moisture in peat is therefore largely due to the water evolved as a result of the chemical changes accompanying its formation. Peat fresh from the bog often contains from 80 to 90 per cent. of moisture.

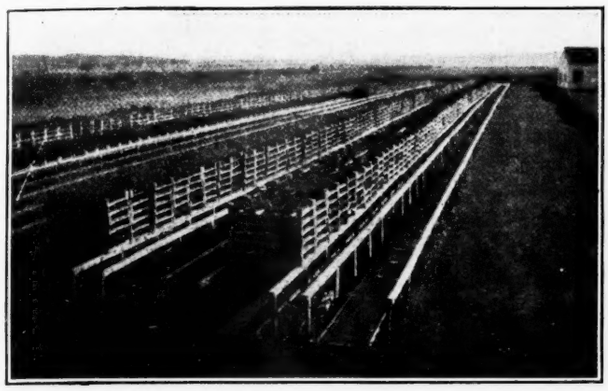


FIG. 2. METHOD OF DRYING PEAT IN SCOTLAND

By air-drying, with prolonged exposure to wind and sun, this moisture content can be reduced to 20 per cent. Below this limit it is difficult if not impossible to pass by means of natural agencies, and this fact explains why peat has never come into wide use for industrial purposes, where the supplies of other forms of fuel have been both plentiful and cheap.

The high percentage of volatile matter in peat is another hindrance to its use for industrial purposes, since the heat produced by its combustion can only be economically utilized in special forms of furnaces. The low percentage of ash and absence of sulphur, on the other hand, are characteristics of the fuel which count in its favor. The disadvantages arising from the high percentage of moisture and volatile matter, however, have been largely surmounted in the latest methods of using peat for power purposes.

The following are approximate analyses made in my own laboratory, on air-dried English, Irish and Scotch peat:

	English Peat		Irish Peat		Scotch Peat	
Moisture	20.3		21.6		26.2	
Coke	27.9	Ash 1.0, Fixed carbon 26.9	21.8	Ash 2.3, Fixed carbon 19.5	24.6	Ash 2.1, Fixed carbon 22.5
Volatile	51.8		56.6		49.2	
	100.0		100.0		100.0	

The calorific value of air-dried peat varies considerably, but the average may be fixed at 7500 B.t.u. Peat briquets dried by natural agencies may be considered as possessing half the heat content of good coal.

Peat Briquets

The earliest method of peat utilization was that of slicing the brown and black peat of the bog into small oblong blocks, called "turves," and allowing these to dry in the sun and air. The turves, which in Ireland are cut 24 in. long by 6 or 7 in. square, shrink considerably on drying, and are only about half this size when ready for use. Much of the domestic fuel burned in the villages and towns of Ireland today is peat won from the bogs by hand labor and dried in this way. Figs. 1 and 2 show the system in use in Dumfriesshire, in Scotland.

Modern methods of briquetting peat, however, are based upon the use of machinery, both for cutting the peat, squeezing out the excessive moisture, and for molding the material into briquets afterward. The aim has always been to reduce the hand labor required for these operations to the lowest possible point.

Some details will now be given of the more notable and successful installations of this kind, commencing with those in use abroad, since it is in Germany and Russia that the greatest progress has been made in utilizing the peat and bogland resources of the European continent.

Germany.—The manufacture of peat fuel briquets, even before the war, was a flourishing industry in Germany, and there is no reason to believe that the industry has suffered any setback during the period of hostilities, since the scarcity of coal and rising price in all countries have favored the production of the cheaper low-grade fuel.

The peat, in the majority of the German installations, is won from the bog by portable centrifugal pump dredgers, which first cut and pulp the peat by means of rotary cutters, and then transport the pulped mass (which contains 15 times its own volume of water), to the factory, where the briquet-making machinery is installed. Here the pulp is first passed through a centrifugal machine to extract the greater part of the water, and is then transferred to a cylinder press, which operates on the principle of a paper-making machine and delivers the peat in the form of a thin sheet to the drying cylinders.

The moisture in this way is reduced to between 15 and 30 per cent. and the peat, in the form of a moist hot powder, is then fed into the briquetting machine. Here it is subjected to a pressure of 30,000 lb., and is molded into the form and shape desired for the finished briquet fuel. No binding agent is required, since the bituminous matter contained in the raw peat suffices in the majority of cases, under the combined influence of pressure and heat, to produce a clean and hard briquet, in which the percentage of moisture is between 11 and 15 per cent. and the ash from 9 to 12 per cent. The calorific value of these machine-made briquets is said to be about seven-eighths that of ordinary coal. The cost of manufacture, in Germany, before the war, was from $1.25 to $1.75 per ton. A plant to produce 50 tons per day was estimated to cost $80,000.

Peat briquets are largely used for domestic heating purposes in Germany, since they are practically smokeless. In order to prove, however, that the generation of power is quite practicable with this form of fuel, some details will be given of the electric power-generating station situated on the Wiesmoor peat bog in East Friesland, North Germany, which is run entirely with peat won from this extensive tract of bogland.

Fig. 4 shows the position of the bog, which is shaded, and the 150-mile district over which the current is distributed. The original power station marked *A* in the plan was erected in 1909, and was designed to generate 3600 hp. It has been twice enlarged and now provides considerably over 6000 hp. to the docks and harbor at Emden, and to the electric tramways that run into Wil-

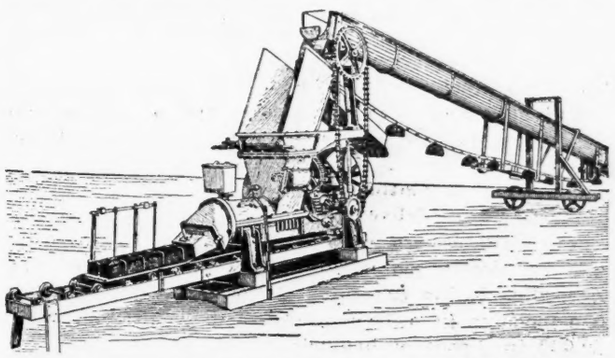


FIG. 3. GERMAN MACHINE THAT MAKES PEAT BRIQUETS

helmshaven and Oldenberg from the surrounding villages. The Ems-Yade canal is also operated with electric power, derived from the Wiesmoor generating station.

Fig. 5 shows the main transmission lines, with their length marked in kilometers. The power house, after the first enlargement, was equipped with four water-tube boilers and superheaters, and with three turbo-generators each of 1250-kw. capacity, delivering three-phase current at 6000 volts. This potential is raised in a separate transformer house to 20,000 volts for transmission purposes.

A portion of the electric power is utilized for operating the electric dredging machines, which form one of the chief features of this installation. The dredgers used at Wiesmoor were designed and built by an Oldenberg firm of engineers and are mounted upon wheels, so that they can be run on timbers or on rails along the edge of the bog. The dredgers are of the chain-bucket type, the chain being driven by an electric motor placed at the head of the bucket frame. A second motor, placed to the left, causes the whole bucket frame to travel in a horizontal direction, backward and forward, through a space of about 13 ft. The wet turf, containing 90 per cent. of water, is emptied from the buckets into a trough and is carried from this by means of a belt conveyor to an electrically operated press. It issues from this press in the form of a uniformly thick pulp, and is then, with the aid of another electrically operated conveyor, carried to the cleared and drained portion of the bogland for drying, where it is delivered in the form of a thick carpet.

In addition to the large dredgers there are many smaller turf-pulping machines at work on the Wiesmoor.

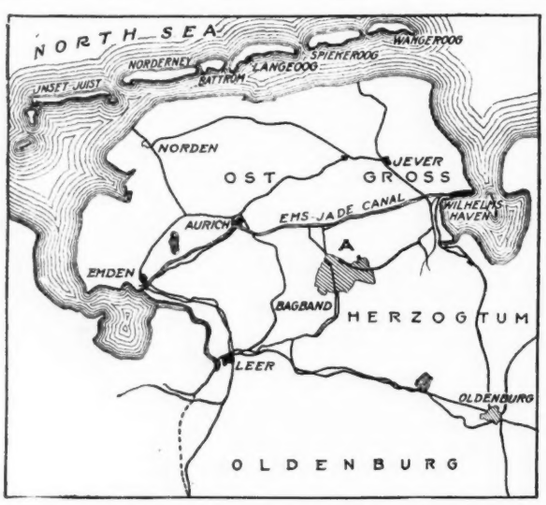


FIG. 4. WIESMOOR PEAT BOG, EAST FRIESLAND, NORTH GERMANY

Those machines are fed by hand and consist of an electrically operated bucket conveyor and a pulping and molding press that tears apart the peat fibers and then pulps them. The peat pulp issues from the press in the form of a continuous thick belt, and a workman standing by the delivery chute cuts the peat into strips. These machines are much smaller than the others, and a 12-hp. electric motor is sufficient for operating them. According to the guarantee of the manufacturing firm, one machine in a 10-hour day can produce 60,000 to 80,000 turf sods or briquets.

Fig. 3 shows a machine of this type at work and Fig. 6 a German design of drying installation with use of artificial heat.

The size of the blocks of half-dried peat when first cut into is 4 x 5 x 13 in. As soon as a dry crust has formed upon them so that they can be handled they are stacked in small heaps, where they are left exposed to the sun and air until the moisture content has been reduced to 25 or 30 per cent. and the blocks have shrunk in size to 2 x 2 x 10 in. They are then loaded in cars, which are drawn along a narrow-gage railway by a gasoline locomotive to the power house. In the summer months the output of dried peat from the dredgers and drying grounds exceeds that of the requirements of the generating station, and the surplus dried peat is therefore built up in large stacks in the open, or is stored

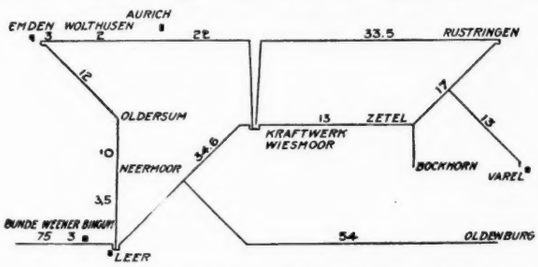


FIG. 5. TRANSMISSION LINES FROM WIESMOOR GENERATING STATION

in covered sheds. When once dried and hard the peat blocks do not readily take up additional water.

The combined dredging and briquet-molding equipment installed on the Wiesmoor can produce in the usual five summer months' operation (April to August) 30,000 to 35,000 tons of dried turf briquets. Improvement has been chiefly directed toward reducing the cost by dispensing more and more with hand labor, both in the winning of the turf and in the after process of drying and storing it until used.

As regards the methods adopted for burning the fuel after is has been dried as described above, a series of belt-conveyors carry the peat briquets to the storage bunkers, and then, after screening and weighing, to the feed hoppers attached to each boiler. The grates are inclined at an angle of 36 deg. to the horizontal, and are divided into two portions, each of 43 sq.ft. superficial area. The halves are fed alternately with briquets by raising a lever that actuates a hinged door on the fire side of the feed hopper.

Since the calorific value of the air-dried peat fuel is low, the draft requires careful regulation in order to avoid great excess of air and a low evaporative efficiency in the boilers.

A steam-raising test made soon after the Wiesmoor plant was started gave an evaporation of 3.01 lb. of water per pound of dried peat, and a boiler efficiency of 73.5 per cent. The mean calorific value of this peat was 4.824 B.t.u., or just about one-third that of good coal. Working out the cost of the fuel from these figures, taking the price of the turf briquets at $1.25 per ton, and the fuel consumption at 11.35 lb. of peat per kilowatt-hour, we find that the fuel required will cost between 0.29c. and 0.34c. This compares quite favorably with the cost of coal in the best managed large modern power stations.

Russia.—Before the war Russia was second only to Germany in the number and capacity of its installations for producing peat fuel. According to Haanel, the number of separate plants in 1910 was 1300, and the

output of machine peat amounted to over 5½ million tons annually. Many private plants existed in connection with cotton mills and other manufactures, some of which were producing nearly a quarter of a million tons of peat fuel yearly.

The method used in these Russian machine-peat plants was similar to that described above—that is, the peat was cut and pulped by a combined type of machine; it was then formed into blocks by hand labor and was finally dried by exposure to the sun and wind in the open air.

Canada. — The Canadian Government in 1909-10 erected a small experimental plant for producing machine-dug peat at Alfred, Ontario, in order to encourage the development of the peat resources of the Dominion upon sound lines. This plant was similar in design and principle to those already described as being in operation in Germany and Russia, the only improvement being that a system of cables was employed to transport the pulped peat to the drying-grounds. The peat produced at this plant in the 1911 drying season had a moisture content of 16 to 20 per cent. and was employed for a series of steam-raising tests in two different types of boiler—a Babcock & Wilcox marine type of water-tube boiler and an internally-fired boiler of the locomotive type. Bulletin 17 of the Canadian Department of Mines contains a full record of these tests, while the table presented below gives a summary of the figures obtained in the six main tests:

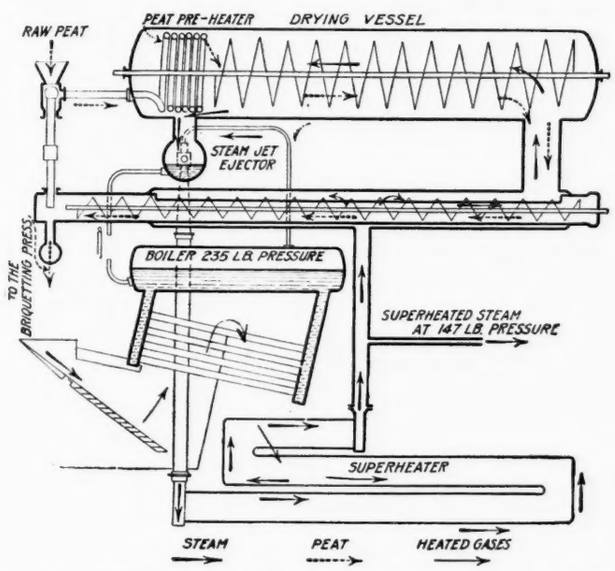


FIG. 6. DIAGRAM OF GERMAN DRYING INSTALLATION

	Water-Tube Boiler			Fire-Tube Boiler		
Test number	1	2	3	4	5	6
Net calorific value of the fuel as fired—B.t.u. per lb.	7490	7490	6990	7130	6970	7110
Peat fired per hour, lb.	476	586	569	160	214	341
Peat fired per sq.ft. of grate surface, per hour, lb.	20.5	15.5	15.0	17.7	23.8	37.9
Equivalent evaporation per hour, from and at 212 deg. F., lb.	1950	2322	2250	621	802	1054
Equivalent evaporation per hour, per sq.ft. of heating surface, lb.	2.88	3.43	3.32	2.89	3.73	4.9
Lb. of dry flue gas per lb. of peat	12.4	9.8	11.1	9.8	9.1	6.5
Temp. of flue gas leaving boiler, deg. F.	720	760	715	690	690	750
Equivalent evaporation from and at 212 deg. F. per lb. of peat as fired, lb.	4.10	3.96	3.95	3.89	3.74	3.09
Thermal efficiency of boiler furnace and grate, based on the net calorific value of fuel, per cent	53.1	51.3	54.8	52.9	52.1	42.2

These efficiencies are low when compared with those said to have been obtained at the Wiesmoor power station, but it must be remembered that peat contains a high percentage of hydrogen, and that when heated two-thirds of the combustible matter it contains is liberated in the form of hydrocarbon gases. A large combustion chamber is therefore required with secondary air admission in order to obtain good results with peat fuel. This does not appear to have been arranged for in the Canadian tests.

(To be continued)

Coal Output of United Kingdom in 1918

The output of coal from mines in the United Kingdom during the 52 weeks ended Jan. 4, 1919, is estimated to have amounted to 226,699,000 long tons, being 21,361,000 tons, or 8.6 per cent. less than in the previous year. The tonnage raised in each of the principal districts was:

District	Output, 52 Weeks Ended Jan. 5, 1918 Tons	Jan. 4, 1919 Tons	Decrease in 1918 Tons
England and Wales:			
Northumberland	10,190,000	9,843,000	347,000
Durham	31,070,000	28,397,000	2,673,000
Yorkshire	40,770,000	35,378,000	5,392,000
Lancashire, Cheshire and North Wales	24,980,000	22,518,000	2,462,000
Derby, Nottingham, and Leicester	33,220,000	29,915,000	3,305,000
Stafford, Salop, Worcester, and Warwick	19,770,000	17,624,000	2,146,000
South Wales and Monmouth	48,340,000	46,529,000	1,811,000
Rest of England	5,440,000	4,791,000	649,000
Scotland:			
The Lothians	4,900,000	4,541,000	359,000
Fife and Kinross	6,360,000	6,362,000	a 2,000
Rest of Scotland	22,930,000	20,713,000	2,217,000
Ireland	90,000	88,000	2,000
Total, United Kingdom	248,060,000	226,699,000	21,361,000

a Increase.

The year's production by four-week periods, contrasted with the output during the corresponding weeks of 1917, was:

Four Weeks Ended	1917 Tons	1918 Tons	Decrease in 1918 Tons
Feb. 2, 1918	20,430,000	18,830,000	1,600,000
Mar. 2	19,880,000	19,140,000	740,000
Mar. 30	19,840,000	18,760,000	1,080,000
Apr. 27	18,660,000	17,700,000	960,000
May 25	20,090,000	16,860,000	3,230,000
June 22	18,730,000	17,790,000	940,000
July 20	18,990,000	15,780,000	3,210,000
Aug. 17	17,770,000	16,040,000	1,730,000
Sept. 14	19,500,000	17,770,000	1,730,000
Oct. 12	19,160,000	17,890,000	1,270,000
Nov. 9	18,960,000	17,750,000	1,210,000
Dec. 7	19,360,000	16,740,000	2,620,000
Jan. 4, 1919	16,690,000	15,649,000	1,041,000
Total	248,060,000	226,699,000	21,361,000

Comparison between the figures for the months March to June are affected by the dates at which the Easter and Whitsuntide holidays fell in the two years. During the period ending July 20, 1918, the output was heavily affected by sickness among the workpeople.

The approximate number of persons on colliery books at all collieries, excluding those engaged in getting ironstone, fire-clay, ganister, etc., has been estimated to be as follows, taking four weekly intervals.

Feb. 2, 1918	985,000	Aug. 17	926,000
Mar. 2	983,000	Sept. 14	927,000
Mar. 30	980,000	Oct. 12	941,000
Apr. 27	957,000	Nov. 9	950,000
May 25	935,000	Dec. 7	959,000
June 22	926,000	Jan. 4, 1919	984,000
July 20	921,000		

The average yearly output of coal per person employed in the coal mines in the United Kingdom was 236 tons in 1918, contrasted with 252 tons in 1914. The average wages cost per ton of coal raised for the 6 months to June 30, 1918, was $2.96, against an average of $1.52 for the complete year 1914. As from June 30, 1918, an additional war wage of $0.30 per day to all persons of sixteen years and over and $0.18 per day to those under sixteen years of age was granted.

Firebox Conditions and Heat Distribution

THE United States Railroad Administration is sending out two sheets showing the conditions both good and bad that may exist in a locomotive firebox, and the distribution and utilization of heat in a locomotive. All data and illustrations are taken from the University of Illinois Experiment Station Circular No. 8, entitled "The Economical Use of Coal in Railway Locomotives." Although the data presented concern especially steam locomotives, it is equally applicable to steam plants in general, particularly those employing internally fired boilers. It is therefore here reproduced in its entirety.

The condition represented in Fig. 1 shows the admission of enough and not too much air. With the grates and draft apparatus in proper condition, a level and uniform firebed permits air to enter without undue obstruction over the entire grate surface and at the same time prevents cold air from entering through holes or thin spots.

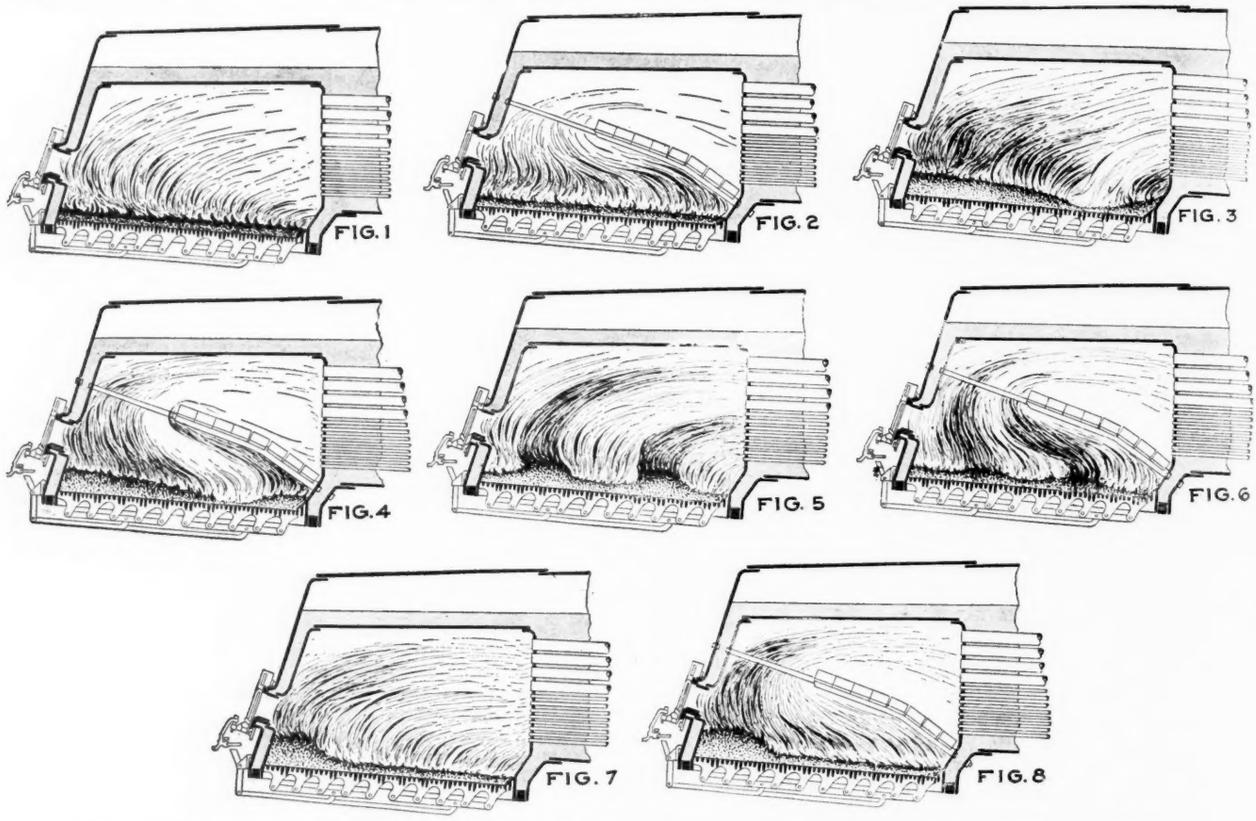
With a light, level and bright fire most of the air supply enters the firebox through a uniform firebed. The firebed being uniform, without holes, clinkers or banks, the air enters in many small streams equally distributed over the entire grate surface. Every part of the fuel bed and of the gases just above the fuel bed has its share of the uniformly distributed and finely divided air streams which are entering through the gates.

High and uniform firebox temperatures result from a proper air supply and a good mixture, and most of the coal and gases burn before they can escape from the firebox. High firebox temperatures insure the burning of combustible gases which with lower firebox temperatures escape without giving up their heat.

When holes occur in the firebed the result is too much air in parts of the combustion chamber and not enough air in others. Holes permit too much air to enter the firebox for the amount of coal which is being burned where the holes exist. The air coming through the hole is in a comparatively solid stream, and where this air comes through there is little fuel to burn. At points where there is fuel on the grate not enough air is coming through, and the opportunity for good mixing is lost. The large volume of cold air coming through the hole cools that part of the firebox, and combustion in other parts of the firebox is retarded.

The condition represented in Figs. 1 to 8 shows the results of both not enough air and of too much air. Banks may restrict the air supply to such an extent that there is not enough air to insure combustion. Even though large quantities of air may enter through the thinner parts of the fire or through the firedoor, the combustible gases arising from the banks may not receive a sufficient supply of air before they escape from the firebox. The firebox may be receiving too much air and still not burn the coal because of the poor mixing.

Above the thinner parts of the fire there may be more air than is needed to burn the fuel with which it comes in contact. This surplus air does not assist in the combustion process, but reduces the firebox temperature and carries off heat through the stack.



FIGS. 1 TO 8. ILLUSTRATING THE GOOD AND BAD CONDITIONS THAT MAY EXIST IN THE FIREBOX OF A LOCOMOTIVE

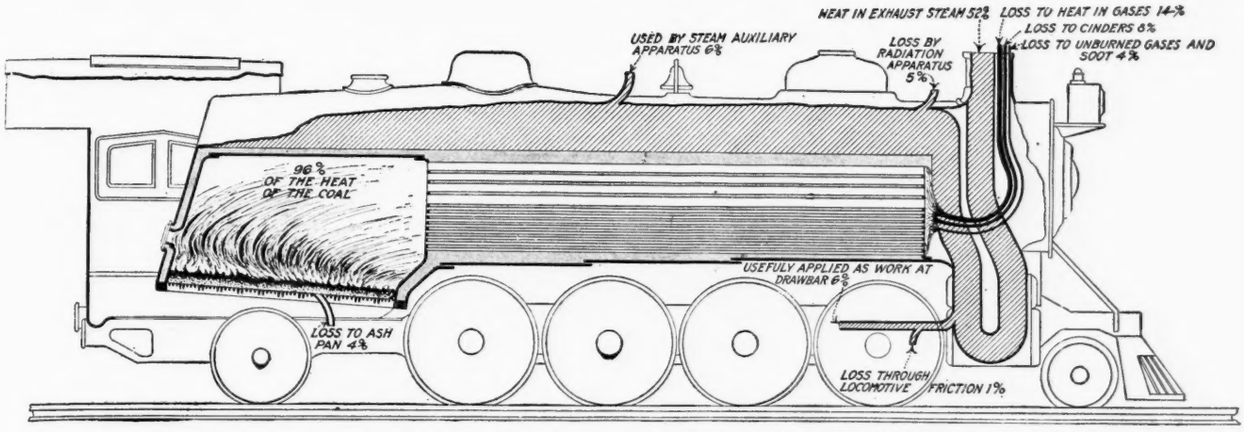

HEAT IN EXHAUST STEAM 52%
LOSS TO HEAT IN GASES 14%
LOSS TO CINDERS 6%
LOSS TO UNBURNED GASES AND SOOT 4%
USED BY STEAM AUXILIARY APPARATUS 6%
LOSS BY RADIATION APPARATUS 5%
96% OF THE HEAT OF THE COAL
USEFULY APPLIED AS WORK AT DRAWBAR 6%
LOSS TO ASH PAN 4%
LOSS THROUGH LOCOMOTIVE FRICTION 1%

FIG. 9. UTILIZATION OF THE HEAT GENERATED IN THE LOCOMOTIVE FIREBOX

Where the coal and gases are heaviest the incoming air supply is least, and neither the incoming air nor the gases arising from the fuel are sufficiently divided into numerous and well distributed small streams to permit easy and rapid mixing. Gases arising from the fuel bed reach the flues in a very short time and mixing must be rapid.

The banks of green coal and the smoky gas arising from them tend to cool the firebox as a whole. Some parts of the fire burn much more brightly than others and the temperature throughout the firebox is not uniform. Smoke and unburned gases result from this condition.

Combustion in the firebox liberates heat from the coal. Combustion is not complete, and all the heat of the coal is not liberated. Cinders and combustible gases escape unburned from the firebox and pass out through the stack.

Much Heat Escapes with Stack Gases

Some of the heat liberated from the coal is carried out of the stack by the stack gases. Air and coal at a temperature of, say, 70 deg. F., go into the firebox; the gases which they form come out of the stack at 500 or 600 deg. F. For each ton of coal which goes into the firebox about 12 tons of air also go in and about 13 tons of gases pass out of the stack. It takes some of the heat of the ton of coal to heat these 13 tons of gases from 70 to 600 degrees.

The heat liberated in the firebox, except that which is used to heat the stack gases, passes through the firebox sheets, the boiler tubes and the superheater units to the water and steam. Some heat is lost by radiation. This comes from all parts of the locomotive which are warmer than the surrounding air. The most of the heat lost by radiation comes out of the steam.

The heat in the steam is used for auxiliary purposes, is lost as leaks or goes to the cylinders to do work. Some coal is lost to the ash pan and ash pit.

Of the heat going to the cylinders a large portion passes out the stack in the exhaust steam. This exhaust steam produces the draft necessary to force into the firebox and through the firebox, boiler and front end the 12 tons of air and the 13 tons of gases which are moved for each ton of coal fired. That portion of the heat converted into work in the cylinders moves the locomotive and its train. A portion moves the locomotive and its parts, and the remainder becomes work usefully applied in hauling tonnage.

New Byproduct Plant Erected at English Coke Works

A new battery of 35 simplex regenerative ovens has recently been erected at the Lambton Coke Works at Fence Houses in Durham, England. These regenerative ovens were decided upon to avoid the erection of another boiler plant, and many considerations entered into the arangement of the byproduct plant. There was an indirect recovery plant of 35 ovens, including a rotary scrubber, and room for only two 100,000-ft.-per-hour exhausters in the exhaust house. It was therefore undesirable to have two separate streams of gas, as there could not be a spare exhauster for each battery.

It was finally decided to have one stream of gas on the pressure side, the suctions from the two batteries uniting at the exhauster and being regulated by valves. The gas then went through a Pelouse tar extractor to the saturator and, after cooling, to the benzol scrubber, which consisted of the old rotary scrubber rebrushed, plus the former tower benzol scrubbers.

The oven walls in this plant are parallel, which is for obvious reasons a great advantage. It has been said that there were some expanding or salt-containing coals for which parallel walls were unsuitable, but this has yet to be proved. Tapered ovens are a relic of the days when, owing to uneven heating, ovens could not be pushed. Some brilliant genius then thought that by giving a 2-in. taper in 400 in. he would accomplish some highly beneficial results.

Coal Output in Taiwan in 1918

According to investigations made by the productive industries bureau of the Government General of Taiwan, the output of coal for 1918 in Taiwan will be about 700,000 tons, although it was at first estimated that there would be an output of about 1,300,000 tons because of increase in the area of coal mines. The demand for Taiwan coal is increasing in South China with Hongkong as a center. The export of coal to South China since January amounted to 247,676 tons valued at 2,424,150 yen ($1,207,000), the export during November being 22,059 tons. Judging from this, the export of coal for the whole year of 1918 will amount to about 260,000 tons, being 30,000 to 40,000 tons less than originally estimated owing to the scarcity of tonnage.—*Commerce Reports.*

How to Compass Industrial Co-operation*

By Charles P. Steinmetz†
Schenectady, N. Y.

SYNOPSIS—*The author advocates large changes in our industrial management, which he hopes will put our industries eventually in the hand of the workers; but he would do this without haste, confiscation, revolution, or ill will. This proposal is to give labor dividends based on the wages paid and on the amount of excess profits above a certain percentage, the gross returns to labor being made equal to the excess profits allotted to capital.*

THERE are two old sayings: "In unity is strength," and "a house divided against itself shall not stand." If these statements are true in anything, they are true in Mother Industry; and they are particularly true today where modern civilization in the world's war has practically become bankrupt, and when we now, as receivers, have to reorganize the world again.

Our industrial life must be coöperative if it would be successful and efficient. If industry is to take care of the world's work in such an effectual manner as to redeem our civilization from the direful effects of the last few years, it must have coöperation. But can that coöperation be obtained?

The radical labor agitator or socialist tells us there can be no peace between capital and labor. He contends that they are inherently antagonistic and must fight to a finish, because the interests of one are against the interests of the other. Yet in industrial depression the employer as well as the employed suffers. So the old-time corporation president preaches to us that the interests of capital and labor are identical; that if the individual interests are trusted to his keeping they will be taken care of.

At the same time every child sees and knows that a dollar more paid out in wages means a dollar less of profit, and that the interests of capital and labor are different—entirely opposite in some respects. We cannot get any further in solving the problem if we take an extreme view one way or the other. The interests of capital and labor are not identical, but are the same in some respects and opposite in others.

In general, in any industry, those interests which have to do with those outside the industry—with customers, etc.—are usually identical, whereas within the industry the interests of employer and employee are often opposite to each other. Thus there are relations in which the interests of capital and labor are identical and some in which they are not identical, but this is not strange. There are many other relations in our modern civilization where there are both identical interests and unidentical interests. Take buyer and seller, manufacturer and customer, landowner and renter. Their interests are, in certain ways, opposed and still we do not have warfare. Because there are some features where their interests are opposite is not reason enough to make them fight each other.

In all these relations which closely duplicate those existing between employer and employee, the conflicting conditions are not settled by warfare. On the contrary there are often—I might almost say very often—friendly relations between the manufacturer and customer. Unfortunately the historic relation between capital and labor is far different. It has been full of conflict.

Why it is necessary that employer and employees—capital and labor—cannot agree and coöperate in a similar manner? The reason is historical. In the days of small manufacture the employer and employee bore an equal standing as regards industrial power. The organization of employers, as represented by the formation of industrial corporations, meant an increased power on the side of the employer and a disadvantage to the employed. As a result, labor organizations were formed; but conditions had already become hostile.

How to bring the coöperation about, how to return to such conditions as should have remained operative, is the main problem, for it is essential that we bring about coöperation within our industry if we wish to meet the demands of the new world.

Present Differences of Long Standing

It has taken two generations of development to create the present unfortunate situation where differences are settled by fighting, and the situation is so strained that we cannot expect to secure this coöperation by merely wishing or talking about it. It is a long, slow, difficult work which will have many setbacks, and we have to remain at that work and fight zealously for it.

Adjustment must come first from the employers, but not for any moral reason. The present situation is not the fault of labor more than capital. It is merely an historical development of a situation beyond the control of man. The employer must have a broader view than his employees. We must not forget that there are still many imperfections in our civilization. Most serious is it that a large majority of men cannot enjoy such a complete education as would fit them to make the most of themselves, and heads of industry as a rule have the benefit of the broader education and must take the broader view of things. We cannot expect the same broad view of one who left school at fourteen years of age as of a man who has enjoyed a more extensive education.

That the initiative must come from capital is clearly realized. But we must remember coöperation does not mean merely spending a few dollars here and there. The work of social reconstruction is probably the most important which faces us today in the industrial field, and men must devote their time and attention to it; and those attempting to solve the problems involved must give the same high-grade service to that work as is given by those in charge of other administration. We cannot expect to see any positive results until we are really willing to approach it more seriously than in the past, giving it our time and interest, and expending in its solution the ingenuities of the same quality of men and the expenditures of a like amount of money as are de-

*Abstract of address entitled "Industrial Coöperation," delivered before the Editorial Conference of the New York Business Publishers Association.

†Consulting engineer and one of the foremost electrical experts of the present day.

voted to the accomplishment of other industrial objectives.

Coöperation implies two parties working together, not one settling the matter and telling the other, "You must do that and that and then we will coöperate." Unfortunately most of the serious efforts made in this direction have been of that character. The employer has worked out plans and then asked the employees to coöperate along those lines. Very often the plans have been good, and the whole scheme would have been satisfactory if it could have been worked out jointly; but it came as paternalism and was therefore tainted from the beginning. That is not coöperation. It is easy to say we must have coöperation; also easy to find fault. But it is not easy to make suggestions as to how it should be done and how the present strained relations between capital and labor should be overcome. Probably there is no single way to bring about true coöperation. Success in it and the methods to be followed depend largely on local conditions and existent social relations. There is no broad and single way. The old-time industrial relation made an industry the private property of the owner and recognized only capital and not labor. This relation was destroyed forever at the moment when President Roosevelt interfered in the anthracite wage dispute and thus brought both sides to terms.

MAYBE IF YOU'D THROW A LITTLE GREEN STUFF INTO THEIR YARD ONCE IN A WHILE THEY WOULD NOT KEEP BREAKING INTO THE GARDEN
BUSINESS INTERRUPTION
STRIKES
WAGE DEMANDS
BUSINESS RESUMPTION
LABOR TROUBLES
LABOR
PROFIT SHARING

THOSE WHO HAVE TRIED IT SAY IT WORKS WONDERS
(Copyright 1919, New York Tribune Inc. Reproduced by Permission.)

The other extreme is the socialistic conception that all wealth is created by labor, to whom all wealth, therefore, belongs, and that capital is a parasite on industry and receives its ability to levy a tribute on the workingman by reason of having acquired a monopoly in the means of production. But that point of view is unjustifiable. Industrial production now requires both capital and labor.

The present labor unrest arises logically from a demand for a share in the profits and management of industry. Since both labor and capital are necessary, it is right that they both have a share in the profits and a hand in the management of the industry. There are several ways of attempting to provide for this, but most of them have been unsuccessful. One way is by welfare work. This is important and useful but offensive and insulting when forced on labor in a paternalistic manner.

It is appreciated where it is done, not as welfare work, but merely as a matter of corporate self-interest. We must realize that the quality of a man's work depends on the conditions under which it is done, for on those conditions depend the self-respect and quality of the man. But welfare work will never, especially if we use that name for that class of activity, bring about coöperation. We should rather term it an Industrial Relation Department or Committee, instead of a Welfare Department. The most difficult thing in coöperation is to put yourself in another man's place and see things as he sees them.

Another method attempted for the purpose of creating a unity of purpose between capital and labor is the system of giving bonuses during times of industrial prosperity, and thus interesting the employee in the industry. To some extent this scheme is all right though it smacks somewhat of paternalism. It might work well in Germany, where people have been trained to look up to their masters as superiors, but it leaves a bad taste in the mouths of Americans. They are prone to ask, "Why not give us an increase of wages instead of a bonus?" The bonus system has also the disadvantage that the workman shares only in profit and not in management. Another attempt in the same direction is the committee system, which is claimed to have been put in successful operation in England. There are several forms of this scheme. There are the committees elected by employees which take up with employers all relations of importance both to the company and the men, and arbitrate the wages, hours, etc. Another form is the joint committee system in which half the members are elected by employees and half are appointed by the corporation. This appears to have much in its favor, but here also there are some difficulties. Labor has its own organization, and action of this kind is apt to be taken by labor unions as an attempt to supplant them and deny them recognition. Labor unions claim that they represent the employees. Facts show that in many cases they are right, because while union men may often have a minority among employees, when serious questions arise experience shows, not infrequently, that the majority of nonunion workers follow the lead of the unions rather than of the nonunion committees.

Shop committees are liable to be considered as eliminating the labor unions by establishing a rival union.

While the leaders of industry recognize the necessity for coöperation, the labor organizations thus far do not. But there is another side. Do we want the committee system? Let us assume it is successful. A board of directors acts for the one side and a labor committee or committees for the other. Is this not another alignment for warfare? Have we not in effect organized two different parties to battle with each other?

The last proposition is the wage dividend. Mother Industry requires capital and labor. Therefore both are entitled to a fair rate of wages for the work done. All

profits beyond that belong to capital and labor. These should be divided as dividends, one part being dividends on capital stock, the other being divided on labor stock as determined by the yearly wages received. This system is in operation in a number of companies, including certain electric-utilities corporations among others. It lacks, however, provision for a share in the management.

But we could carry it farther and recognize labor as equivalent to capital and give the labor stockholder the same directing power in the management as the capital stockholder. This would be revolutionary, but both would share in the profits, getting dividends, one on capital stock and the other on what may be called "labor stock."

Both could share in the management and, if the "labor shareholders" so preferred, labor-union officials could hold the proxies and thus watch over the interests of the employees. This does not set up a rival administration but brings about joint control by evolution and not by revolution. The question is, What employees should be recognized as stockholders? Should everyone, even if he joined in the company's operations only yesterday, vote today with those of longer affiliation?

There are many things that show that only those who have been with the organization for a number of years should be recognized as wage stockholders receiving dividends and taking part in the management. We could set the limit at ten years. There would not then be many such voters, and their enfranchisement would not make any radical change in industry. Every year or so the minimum could be reduced till it fell to six or even five years. This would eliminate any opposition except from the extreme socialists who refuse in any way to recognize capital. The workers might be encouraged to buy stock with their labor dividends and so eventually, receiving both capital and labor return, they would finally become predominant in the industry by a natural and desirable evolution. In fact, in the final wind-up, the only stockholders left would be the workingmen.

Thus what we look upon as revolution would be brought about by the peaceful and unopposed forces of evolution. Our society would be socialized with the good will of everybody.

Coal Operations in Newfoundland

A coal company consisting of more than 200 shars holders was organized in the early fall of 1918 to operate and develop the bituminous coal area in the district of St. George's, on the western shore of Newfoundland. By November, 1918, sufficient capital had been subscribed to commence operations, which have been continued to date. An entry has been driven in one seam a distance of 150 ft.; the level of this entry is about 135 ft. below the point where the seam outcrops. Over 250 tons of coal have been mined, and samples used in St. John's are said to have better burning qualities than any now imported. At the beginning of operations the coal seam was 4 ft. 9 in. thick and continued increasing in thickness up to 5 ft. 4 in. at the face of the entry, with every indication of further improvement as operations advance. The entry has opened up about 5000 tons of coal. By the last of May it is hoped the entry will have been advanced an additional 100 feet.

Illinois Mining Institute Meeting

The annual meeting of the Illinois Mining Institute will be held May 22, 23 and 24, on board the "Golden Eagle," which will leave St. Louis at 10:00 a.m. on Thursday, May 22, for Quincy and Keokuk. At 11 o'clock S. T. Jenkins will deliver the address of welcome, to which William Hall will respond. After lunch the afternoon session will start at 1:45 with a paper entitled "Power Transmission Methods in and Around Coal Mines," by W. S. Farnham, mining engineer of the Goodman Manufacturing Co., followed by one by Steve Gosnell on "What Constitutes a Proper and Lawful Examination of a Mine by a Mine Examiner."

At 9:30, Friday morning, J. C. Thompson, director of the Department of Mines and Minerals, will read a paper on "Should the Abandoned Workings of a Gassy Mine Be Sealed or Ventilated," followed by discussion. At 1:30 p.m. J. H. Tracey, electrical engineer of the Electric Storage Battery Co., will read a paper on "Care and Attention That Should Be Given Storage Batteries," and after discussion of this subject Martin Bolt, assistant director of the Department of Mines and Minerals, will read a paper on "What Has Been the Result of the Consolidation of All Mining Agencies in the Department of Mines and Minerals."

On Saturday, at 9:30, a business session will be held, the meeting adjourning at 11:30 on the arrival of the boat at St. Louis. Those desiring to attend the meeting should advise S. T. Jenkins, Boatmen's Bank Building, St. Louis, Mo., not later than May 20.

Convention of National Coal Association

The National Coal Association will hold its annual convention May 21, 22 and 23 at the Congress Hotel, Chicago, Ill. The opening session on Wednesday begins at 10:00 a.m., with a roll call of the association and individual members, followed by appointment of committees; address by H. H. Merrick, president of the Chicago Association of Commerce; business meeting; consideration of proposed amendments to the charter; reports of the president and general secretary. In the afternoon, at 2:30, the reports of the treasurer, finance committee, railroad relations committee, cost accounting committee, foreign trade committee, credentials committee will be read; also report of election of directors by districts and at large.

On Thursday, at 10:00 a.m., the board of directors will meet, after which the meeting will be addressed by Dr. H. A. Garfield, United States Fuel Administrator. At 2:30 p.m. the president of the association will address the convention, followed by A. F. Sheldon, president of the Sheldon School and founder of the Business Science Society, whose address will be on selling coal for a profit. The session will end with questions and discussion.

The morning session on Friday starts at 10:00, with demonstration of an open-price bureau in operation, followed by an address by H. A. Wheeler, president of the Chamber of Commerce of the United States, on "The Sherman Law." At 2:30 in the afternoon Mr. Sheldon will address the meeting on "Bolshevism and What American Business Men Should Do to Meet It," after which a little time will be given to questions and discussions, followed by report of the resolutions committee.

PANORAMIC VIEW OF EXPERIMENTAL MINE AND EXPLOSIVES STATION NEAR BRUCETON, PENNSYLVANIA

The New Pittsburgh Station of the Bureau of Mines—IV

By George W. Harris
Editorial Staff, *Coal Age*

THE Bureau of Mines each year finds an ever-increasing number of problems that require solution. For example, there is the work of the fuel section at the Pittsburgh station, which is under the charge of H. Kreisinger, fuel engineer. The situation regarding the supply and use of fuel throughout the country was most acute during the war period. There were many requests from the public for advice and for special direction in fuel problems, all of which tended to divert the energies of the fuel section from its normal activities; and in the midst of all this, the laboratories of this section were moved from the old arsenal in Pittsburgh to the new building on Forbes Street.

During most of the time this country was in the war the bureau collaborated with various Government organizations, such as the Fuel Administration among others, which required technical information about coal, mining, and allied subjects and industries. The assistance afforded by the chemical and mining sections in these matters has been referred to in previous articles. The station's fuel section took an active part in tests on fuel, boilers and so on, and work of this nature is still being carried on for the United States Shipping Board at Erie, Penn., where marine boilers are being investigated. This research includes the combustion of coal in the furnace and the absorption of heat by the boiler itself—in other words, the combustion and heat transmission processes are followed from the grate through the furnace and the boiler passes up to the stack.

This work applies to all boilers and is of special interest to those operating boiler plants in any industry. Hand-fired furnaces have been worked on up to the present time, but all types of stokers will be taken up by the bureau either in the field or in the laboratory. In this boiler work the temperature at the different passes is measured and the absorption of heat is studied at various points. In connection with this whole matter Mr. Kreisinger emphasizes the following fundamental idea: Coal in a hand-fired furnace is gasified in the fuel bed on the grate, and the vital problem is how to properly mix the combustible gases with air in order to burn them as they rise from the fuel bed. Sufficient air cannot penetrate the fuel bed to accomplish complete combustion; also, it is a misconception to think that the speed of combustion in furnaces depends on temperature. The most important fact is that the rate of combustion depends on the speed with which suffi-

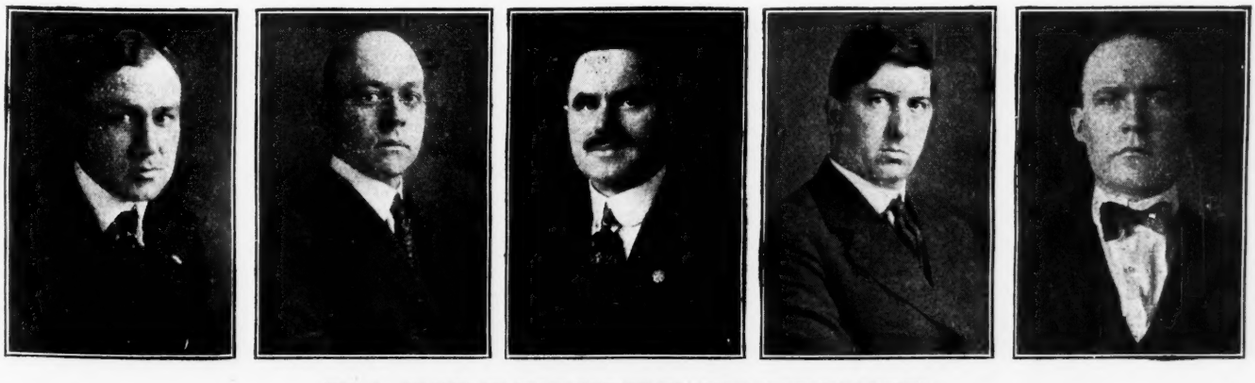


FIG. 1. GROUP OF PITTSBURGH STATION SECTION CHIEFS

Left to right—R. H. Kudlich, mechanical engineer; S. P. Howell, explosives engineer; H. Kreisinger, fuel engineer; L. C. Ilsley, electrical engineer; S. B. Foley, metallurgical engineer.

cient air is mixed with the gases to burn them. The temperature in a furnace is always high enough to actually burn the gases, but the point is that there is not enough air intimately mixed with them to support complete combustion. Steam-raisers should be especially interested in the fuel section's work on marine boilers, and it is this type of boiler which is shown in Fig. 2. Referring to this illustration, an attempt is being made by the fuel engineers to introduce more air into the furnace and to mix it thoroughly with the combustible gases, first drilling holes in the furnace door; second, through holes in a bridge wall erected at the rear of the grate; and thirdly, by means of a transverse air pipe at the first baffle plate. The air pipe has nozzles along its length through which air is directed into the burning gases as indicated. This air should actually penetrate at least to the center of the gases over the fuel bed and a complete mixture be effected.

If combustion takes place in the middle of the nest of boiler tubes, the heat is mainly used to advantage only in the remaining half of the boiler. A consider-

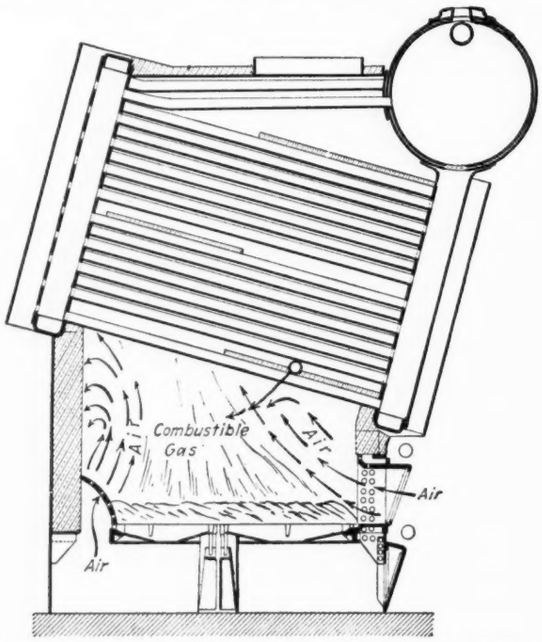


FIG. 2. SECTION OF MARINE BOILER SHOWING INTRODUCTION OF AIR

able percentage of the heat may be lost in that way. Often the flames continue through the boiler tubes into the stack, and this delayed combustion among the boiler tubes becomes quite a factor when the boiler is being driven hard. Proper admission and good mixing of air with the burning gases is a serious problem, and a great deal of information has been obtained in this connection. When the account of these investigations is published it should make most interesting reading. This work on marine boilers has been carried on in coöperation with F. W. Dean, of the Shipping Board, and the general trend has been in the direction of research of somewhat an advisory nature.

The fuel section at Pittsburgh has a large field to cover. Among various fuel activities striking progress has been made in the byproduct coking industry in the United States during the last few years, but the bureau has not been able to keep pace with advance in this field for lack of funds. Furthermore, the byproduct companies that control patents on ovens and processes in this country do not seem inclined to coöperate with the bureau, preferring rather to do their research work privately.

Mr. Kreisinger considers the saving of byproducts extremely important and believes that the byproduct coke oven has the biggest future of any of the methods of using coal. A large part of the bituminous coal should go to the byproduct plant, where the coal will be used to the greatest advantage. Here the byproducts will be saved and the coke can be burned under boilers. Black smoke coming from the coal-burning furnaces is an indication showing that we are using coal in the wrong way. That part of coal which causes the smoke escaping from the boiler stack could be much better turned into gas and liquid fuel. The heat units in gas are worth, for household purposes, eight to sixteen times as much as the same B.t.u. in coal under steam boilers. This attitude taken in regard to the proper method of using coal is from the standpoint of the fuel engineer. The chemist handles another phase of the problem, that connected with the drugs, dyes and other byproducts derived from the coal tars.

Powdered fuel offers another field for research work which the bureau will enter into energetically in the near future. Considerable progress has been made in the utilization of coal in this form commercially, and the fuel section plans to investigate processes already in use rather than to originate new methods. Those who have experienced difficulties when using powdered fuel will be assisted if they will coöperate to the extent of contributing the carfare and expenses of those sent to investigate such matters at their plants. First, the bureau will go to the plant where it will aim to locate troubles by trying out the process on a large scale. Then work on special individual problems will be carried on in the Pittsburgh laboratories and an effort will be made to solve them. Work of this kind will be started in the next few months and as much time devoted to it as is given to hand-fired problems.

Among other things, investigations will be made of what actually happens in the combustion space of a powdered-coal-burning furnace. There seem to be two main problems in firing powdered coal under stationary boilers—ash disposal and ability of the furnace to stand the temperature and effect of the slag. The furnace firebrick is affected physically by the slag deposited on it, and its chemical composition is also changed. But these problems are more or less common to steam boilers fired by any method. A study will be made of the composition of the ash and then an attempt will be made to devise a brick to stand up to the work. An endeavor will be made to lower the temperature, say to 2400 deg., and to do this by having the furnace absorb the heat close to the point where it is generated rather than by excess of air. The bureau will also take up the investigation of heating furnaces used by steel and other plants in which powdered coal is burned.

The problems just mentioned are some of those occurring to a practical man at first sight. Other investigations will go on by momentum gained in war work. Some kinds of work may not seem to be so important, but they are valuable research investigations nevertheless—for example, heat transmission in steam boilers among others. Heat-transmission apparatus will be installed in the fuels laboratory to test the efficiency of boilers under different conditions—using tubes of different diameters and lengths, for example; also, the

effect of initial temperatures, the velocity of gases and scale will be matters considered in connection with the efficiency of a boiler. Furthermore, small furnaces will be installed in the laboratory for testing the combustion of anthracite and coke, also carbon in soot. The combustion of coke is especially important to metallurgists. Some coke dissolves or is eroded rapidly in furnaces; other coke may not be quickly enough affected by heat. Tests will be made on coke of various physical make-up. While a considerable part of the fuel section's work is connected with the details of special problems, nevertheless much of its research has to do with the first principles which control the uses of coal.

A big field for research work at present is the utilization of lignite. The Government has recently appropriated $100,000 for investigations in this field, and the bureau is preparing to take the matter up intensively. Lignite in the main is used locally—in agricultural districts and in sections away from manufacturing centers. Speaking generally, 55 to 60 per cent. of the heat value of lignite is realized, whereas 65 to 70 per cent. efficiency is obtained in the case of a good coal. This difference is partly due to the moisture in lignite. A properly designed furnace should improve the efficiency. A promising future opens up for lignite when used in gas producers. Here the moisture in the lignite is not so detrimental. In general, it is necessary to fit this fuel to market conditions and put it to such use for which it possesses natural advantages. The same is as true of lignites in Texas as in the Dakotas, but in the former state the lignite deposits are within 50 miles of the coast, and may be utilized for industrial purposes.

Those investigations relating to the prevention of electrical shocks, electrical fire hazards and the initiation of mine explosions by electric sparks, flashes or electrical phenomena are conducted by the electrical section. This section is under the direction of L. C. Ilsley, electrical engineer.

The Bureau of Mines has developed a system whereby mine apparatus that meets certain requirements for safety is approved as permissible for use in gaseous mines. The electrical section has done considerable work in this connection. A number of motors for use with coal-cutting machines have been approved and several types of electric miner's safety lamps have been developed and are on the permissible list. These approved lamps are being widely used by the miner. They materially increase the safety of mining and also in many instances increase the efficiency of the workman.

This approval system is worthy of a few words in explanation: Several steps enter into or lead up to the establishment of a line of permissible equipment: First, a decided need for such approved apparatus must exist. Being assured of the need, a preliminary investigation is made of such apparatus as is then on the market or contemplated. From information thus gained an official schedule is prepared outlining conditions under which tests will be made, fees to be charged for conducting tests in conformity with the schedule, etc. These schedules are sent out to anyone interested in that particular line of equipment. This gives every manufacturer an equal opportunity, which is entirely optional on his part, of submitting equipment and having it on the Bureau of Mines permissible list.

In the past a number of manufacturers have submitted equipment to be tested under permissible schedules with a resulting improvement in equipment and greater safety to the mining public. The future of this system is assured. The calls for new lines of approved mine equipment are frequent. Such a system bearing so intimately on questions of safety can not but have a bearing on mine compensation insurance. It seems probable that insurance rates will be reduced wherever permissible apparatus is adopted. If such is the case, there will be an added incentive for purchasing approved equipment. No police power is exercised by the Bureau of Mines as to the use of approved equipment in the several states, but many operators insist upon apparatus having the permissible seal of the bureau.

The electrical section is at present occupied with the tests of equipment submitted under the different permissible schedules and in conducting preliminary investigations to obtaining data for the establishment of new schedules, chief of which are for shotfiring batteries and storage-battery locomotives. In addition to the foregoing the section is interested in rules and laws connected with installation, inspection and maintenance of electrical equipment.

In all investigations bearing on the approval of equipment an effort is made to be practical. Laboratory tests

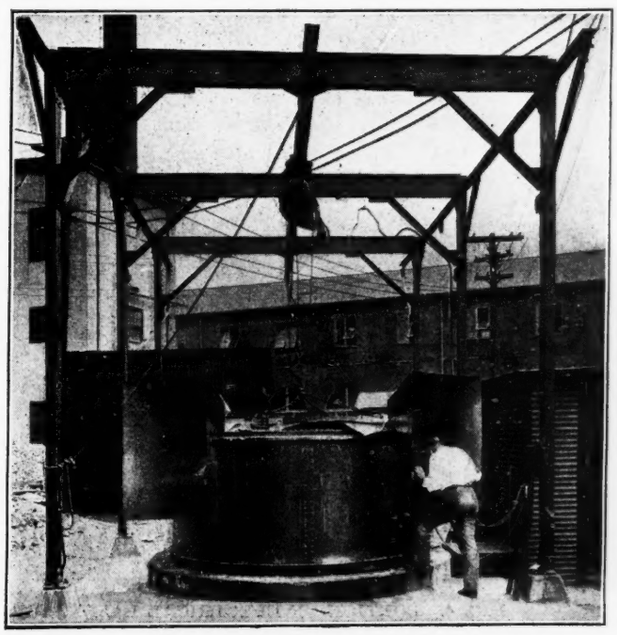


FIG. 3. MOTOR TESTING GALLERY NO. 5

are followed up by field investigations. Also, all approvals are conditioned to satisfactory field performance. Several bulletins and technical papers have been published covering different activities of the section.

Motors for use on various mine equipment are tested in gallery No. 5, shown in Fig. 3. This testing gallery is located just outside the main building adjacent to the south end of the chemical wing, and consists of a steel shell arranged so that air and gas can be mixed in it in any proportion desired. It is surmounted by a small crane by which the lid of the gallery may be removed to allow pieces of machinery to be lowered into it. To prove the suitability of motors for use in atmospheres containing firedamp, the motor to be tested is placed in the gallery, which is then filled with an explosive mixture. It is also made certain that this gas mixture fills the case around the motor itself. The gas inside the motor is now ignited. The protecting case to the motor

is considered satisfactory provided no flames issue from it and provided the gas in the gallery outside the motor is not ignited by the explosion which takes place within the motor. Fifty or more tests are usually made for each motor investigated. In addition to this test, the apparatus is carefully inspected to see that all motor casing joints have proper flanges; also, to see that there are no through bolt holes or other openings which will permit flames to pass to the outside. It is assumed that gas will be fired in the motor case at times, and the explosion must not propagate from the motor to the surrounding atmosphere.

Interesting investigations are being conducted in the mechanical section at the Pittsburgh station by R. H. Kudlich, mechanical engineer, under the direction of the chief mechanical engineer of the bureau, O. P. Hood, with headquarters at Washington, D. C. Mr. Kudlich is investigating mechanical appliances used about mines, with special regard to safety. At present safety catches for mine cages are receiving attention, and this work will lead to the establishment of a schedule for the approval of this type of apparatus similar to the plan followed by the electrical section and to the development of really efficient safety catches. Much other mine equipment will be similarly investigated in the future. Shaft gates, overwind devices, cages and skips, hoisting ropes and other mechanical haulage devices are a few of the many things considered as problems for investigation. These all have to do with the safety of the miner and naturally have first place. But conservation of resources and elimination of waste also constitute an important part of the bureau's work. Under this latter would logically come the economic handling and preparation of coal in the mine and on the surface.

We consider our work always in a course of evolution, says S. P. Howell, explosives engineer, in charge of physical tests of explosives and blasting supplies of the bureau. Additional tests are instituted from time to time if they mean increased safety or efficiency in the use of explosives. Changes in the methods of the explosives section are made after due consideration and study of conditions, or after conferences with the users or manufacturers of explosives. The headquarters of the explosives section is at the Pittsburgh station. Here also the explosives-chemical work is done. But physical tests of commercial explosives are made at the Explosives Experiment Station built adjacent to the Experimental Mine near Bruceton. The men carrying on this work have the proper sociological benefits. An up-to-date wash and changehouse has recently been installed for both the mine and explosives station men. Also a clubhouse has been completed where single men may live and where hot lunch may be served to all employees. It is hoped that in time houses may be built at this field station for employees with families.

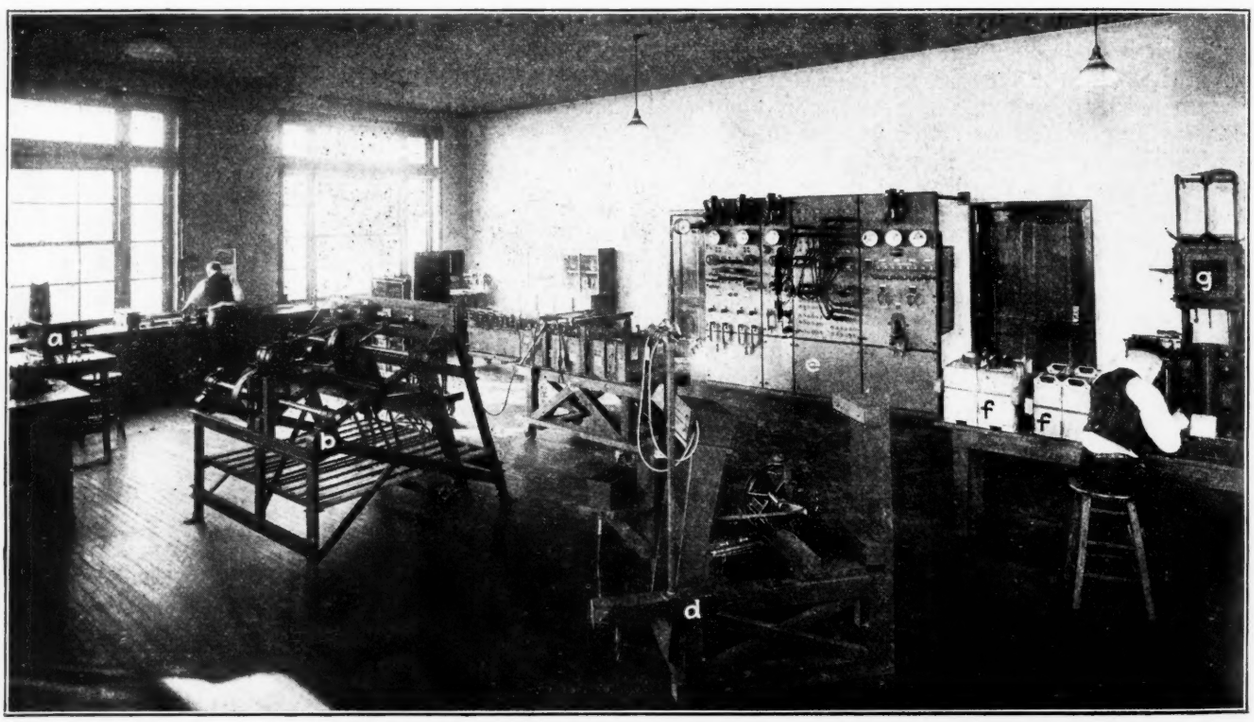


FIG. 4. PORTION OF ELECTRICAL LABORATORY SHOWING APPARATUS FOR TESTING EQUIPMENT

With such improvements in view, the bureau expects to acquire more land for the purpose.

The explosives testing station was built for peace purposes, but a great deal of war work was done there for the United States Engineers and the Ordnance Department. These special investigations are about finished now and peace work will start again. At this station tests are made primarily of all explosives and blasting supplies used in mining operations, and a large portion of the time is used in testing explosives to determine their permissibility for use in coal mines. An important special work recently has been the proving of the practicability of T N T for industrial purposes—but not for use in coal mines. A tremendous quantity of this explosive was accumulated in this country for war purposes. The present tendency seems to be to divert this valuable asset essentially to Government departments—that is, to have the Reclamation Service, the Alaskan Commission and other similar projects use all this explosive.

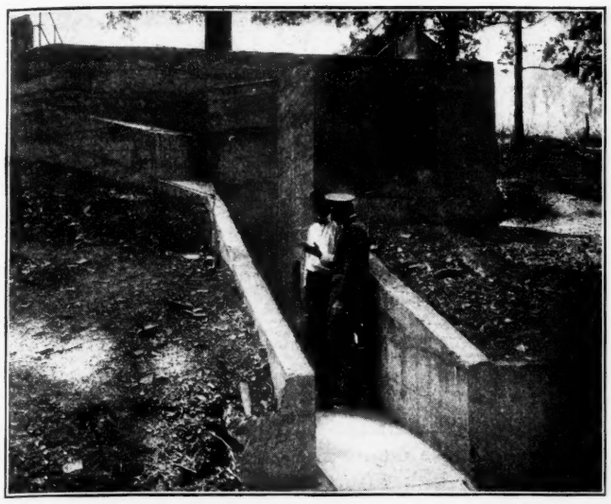


FIG. 5. BOMBPROOF FOR TESTING EXPLOSIVES

The explosives section has been doing some T N T research work, but in a way not to interrupt the regular work of this department. At present requests from manufacturers have been made for tests of about 40 explosives—so there is a quantity of work on hand. The metal-mining men especially want to know what gases are given off by explosives. This is important, for in metal mining much larger amounts of explosives are used than in coal-mining work, and the ventilation is not so good in a metal mine as in coal workings.

A good view of the new Explosives Experiment Station buildings and the plant at the Experimental Mine is given in the headpiece. The former buildings have only recently been constructed. However, the apparatus used at the old arsenal was set up here and in moving such equipment from the old site and establishing it at the new station improvements were effected in installation and operation. The various pieces of equipment are distributed in three buildings which are located about 50 ft. apart. The fourth building is an office.

The old gas and dust gallery moved from the arsenal grounds to its new location here has been described in the Aug. 25, 1917, issue of *Coal Age*, under the title, "Coal Mine Investigations—III." This gallery is a steel tube simulating a mine entry and has an internal diameter of 6 ft. 4 in. and a length of 100 ft. The new features added to it include an extension of 145 ft. consisting of a 20-ft. movable section between the old and the new parts. This gives a gallery 245 ft. long. The 100-ft. portion of this tube will be used for testing the permissibility of explosives. When the movable section is in place it will form a gallery which the Experimental Mine engineers propose to use for testing the explosibility of various coal dusts. The ballistic pendulum, large and small impact machines, pendulum friction device, Bichel gages, calorimeter and flame tests apparatus are used here the same as at the arsenal. All buildings here are constructed of hollow partition tile with stucco outside and concrete foundations and floors.

The bombproof, where the rate of detonation of explosives is determined, is constructed entirely of concrete and the greater part of it is below the surface of the ground on the hillside (see Fig. 5). The top is well reinforced with iron rods; 1-in. armor plates protect the top and sides of the interior against shots. Considerable war work has been done here. It was started in August, 1918, and is still going on.

Shortly the explosives section will carry on similar work to the war research, with permissible explosives. In making these tests the explosives are placed in tubing through which four wires pass transversly. From the bombproof the wires are carried to a Mettegong recorder in an adjacent house, as shown in Fig. 6; it registers the interval of time between the breaking of each of the four wires passing through the explosive in the bombproof. The practical value of this work lies in the fact that explosives with a high rate of detonation have a great shattering effect.

One of the most recent sections to be instituted at the Pittsburgh station was the metallurgical. This section was organized during the war and was run on a coöperative basis with the Ordnance Department. Samples of steel which went into service under the War Department passed through the metallographic laboratory at Pittsburgh. Here steel was examined under the microscope with respect to general conditions as to heat treatment and quality of metal. An intensive study from the viewpoint, both of the laboratory and the plant, was made of certain defects which occasioned the greatest trouble to ordnance manufacturers with the idea of locating their cause and finding means for prevention. Not only was steel examined here, but non-ferrous alloys as well. Out of this war work various problems have come forth in the field of iron and steel and ferrous and non-ferrous alloys to which this section is giving its attention. In this connection an instance can be cited—the investigation of ferromanganese production in the blast furnace, which started during the war, is being carried to a conclusion and will doubtless lead to excellent results.

With the reorganization of the Bureau of Mines personnel after the war, there will be quite an increase in the Pittsburgh station force. At the present time, says Mr. Lyon, there seems to be two branches of research which should be emphasized at this station in addition to the investigations already being carried out there; that is, work on fuels and in the line of ferrous metallurgy. This station being in the world's greatest coal and iron industrial center, it will be possible to make a most intimate study of both problems. All these advantages and the splendid equipment of the new building should attract to the Pittsburgh station other high-class men wishing to undertake research work and make this the greatest technical laboratory of the world.

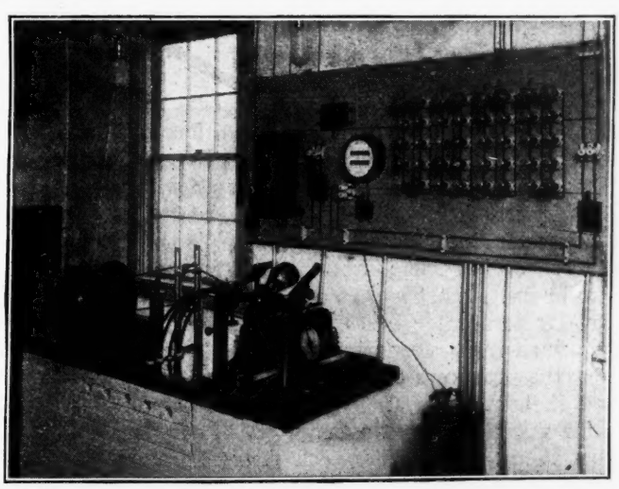


FIG. 6. METTEGONG RECORDER FOR REGISTERING TESTS

Some of the Problems That Beset the Exporting of American Coal

By far the livest matter of coal interest in Washington this week is the export problem. The fact that the plans being worked out by an interdepartmental committee have been kept as secret as possible has caused much additional speculation.

Some features of the plan, which have leaked out, are not meeting with unanimous approval from the coal industry. It is stated that the Government is more interested in supplying coal to meet a temporary demand in certain European countries than it is to pave the way to build up a permanent exporting trade in South America and elsewhere, and is anxious to obtain detailed supervision of this export trade.

Italy is said to be requesting 1,000,000 tons of American coal each month. Switzerland wants 60,000 tons a month. France wants 5,000,000 tons to be delivered at Mediterranean ports during the next twelve months. Northern Africa will require some 2,000,000 tons during the next year. Some of the coal men are inclined to object to having their industry turned into an eleemosynary organization without some compensating advantages. This is especially the case when England is busy making five-year contracts and otherwise doing all it can to reëstablish itself in South America.

Despite the exceptions which are taken to the preliminary plans which are being worked out, there is reason to believe that a program will be arranged which will allow much of the emergency coal to move to Europe and at the same time secure for coal exporters some valuable assistance from the Government in obtaining permanent business.

Some predict that before many years practically all of the coal for Mediterranean ports will be brought through the Dardanelles from the Russian mines. The possibility that some of the coal producing nations of Europe may have foreseen this condition is thought by some to be the reason why they are willing now to allow themselves to be undersold in the Mediterranean by American coal.

A combination under the Webb Act is not looked upon with favor in some quarters. It is felt that the export coal business must be handled by a private corporation. Five factors enter into export coal: Production, selling, financing, transportation and docking. It is feared that the producers of export coal will not be willing to pool their outputs. Central Pennsylvania and West Virginia producers, for instance, might not be willing to pool their outputs. Various districts might be mentioned where such an agreement would be very difficult indeed to obtain. In the same way, there would be too much conflict between the existing selling organizations to allow their activities to be pooled.

The other three factors, however, can be pooled. The railroads will look after the docking in the United States but the business of exporting coal is too young to attract the capital of individual American companies into the uncertain field of dock-building in foreign countries. As a result, other docks must be obtained. In many cases, these are already in the hands of the English.

Shipping is uncertain. Therefore, it has been proposed to leave production unrestrained and selling on the other side unrestrained. At the same time, it is suggested that a few of the large corporations combine to look after financing, ocean transportation and foreign dockage. A powerful corporation of this character could make contracts with those in control of ships, which would provide for the carrying of coal in any quantity to any place. Temporary or permanent docks could be provided as needed and arrangements could be made with bankers, so that coal operators could get their money when their coal was dumped at tidewater. Under this plan, the inspection of the coal would be placed in the hands of the Bureau of Mines, thereby insuring the receipt at foreign destinations of coal conforming to Government specifications.

Uniform Bill of Lading Prescribed by the Interstate Commerce Commission

Proposals looking to a special form for bill of lading for coal shipments were dismissed by the Interstate Commerce Commission on Apr. 30, when in its bill of lading opinion, is said briefly: "We are not convinced, upon consideration of all the facts of record and the arguments made in advocacy of such bills, that they are essential. It is believed that the uniform bills prescribed will be adequate to care for any peculiar requirements of such traffic."

The opinion covering the matter of bills of lading is regarded as one of the most important ever issued by the Commission. It does not deal with the negotiability features of bills, those matters having been definitely taken care of by the so-called Pomerene Act. It discusses the fundamentals and history of the common law of the carrier's liability and its contractual exemptions from and limitations of liability, tracing the development of the law in this country down to the time when Congress, by reason of conditions that had come about and in view of the decisions of the Supreme Court sustaining the validity of contractual limitation in many important cases, found it necessary to enact legislation imposing certain specific duties upon

carriers respecting the issuance of bills of lading and making unlawful some of the exemptions and limitations of liability for which, under the common law, they had theretofore been free to contract with shippers.

The report is accompanied by forms of bills of lading which the Commission finds would be just, reasonable and lawful to be used upon the lines of all carriers subject to the act to regulate commerce.

Program of Convention of American Wholesale Coal Association

The main features of the program of the American Wholesale Coal Association's convention, which is to be held in Chicago June 3 and 4, have been decided upon. J. D. A. Morrow, vice president of the National Coal Association; James F. Callbreath, secretary of the American Mining Congress; John E. Lloyd and W. R. Coyle will discuss different phases of coöperation between different branches of industry. George Otis Smith, the Director of the United States Geological Survey, will deliver an address on "The Best Use of America's Coal." Gibbs L. Baker will speak on "The Wholesaler in Coal and His Taxes."

Government control is to come in for discussion as follows: Do the Wholesalers Want the Government to Help the Coal Trade in Any Way? by C. M. Moderwell. Subdivisions of the question will be discussed as follows: (a) To hold reserved coal land in reserve until needed—E. W. Parker. (b) To modify anti-trust laws with respect to the mining industry—E. W. Sims. (c) To help with the practical movement in conservation—Van H. Manning. (d) Do the wholesalers believe that politicians could be compensated in any way for thus serving the public purpose? That is, in exchange for help given the coal industry, is it necessary to give the politicians any power over coal; or should Government help be demanded as a right inherent in the coal industry?—L. Romanski.

Coal distribution in several of its phases is to be discussed by Gibbs L. Baker, E. M. Platt, J. V. Mayhew and D. C. Shoemaker. Railroad control is to be discussed by George H. Cushing.

A banquet will be held the night of June 3. Noah H. Swayne, F. S. Peabody and G. H. Cushing will be the speakers. The convention also will listen to the regular reports of officers and committees.

Suggests a Coal Policy for Alaska

In a report submitted to the Alaskan Engineering Commission, Andrew Christensen declares that the following must be considered in adopting a coal policy for Alaska:

1. Whether there should be any change made in the coal land leasing law of Oct. 20, 1914.
2. Whether there should be any changes made in the terms of the present lease and the leasing regulations under the law.
3. Whether or not the Government should undertake a thorough prospecting of all the leasing units in the Bering River and Matanuska coal field.
4. Whether the navy should undertake the mining of coal under the million-dollar appropriation.
5. To what extent if any should the Government undertake the mining of coal.
6. Should the Government interpose objections to the construction by private interests of railroads into the Bering River coal field.
7. If so what should be the policy of the Government with reference to furnishing the necessary transportation facilities for the Bering River coal.
8. What steps if any should be taken with reference to furnishing necessary transportation facilities for coal between Alaska and the States.

These questions are all vital to the success of the development of the coal industry in the Territory and should be given immediate and careful attention.

The Alaskan Engineering Commission itself is actively engaged in the mining of coal. Its mining work is in charge of Sumner Smith. The principal work is being conducted at Eska and at Chickaloon.

Believes Large Savings Possible in Mining and Marketing of Coal

By stopping the waste in the operation of coal mines, it is possible to cut the cost of production by 40 per cent. of what it was formerly. By avoiding waste in wholesaling, it is possible to cut the wholesaling cost 16⅔ per cent. under what it has been heretofore. The cost of retailing coal can be cut down 33⅓ per cent. These conclusions are those of George H. Cushing, secretary of the Wholesale Coal Association, who has made a careful study of the matter. To illustrate the principal waste in the retailing of coal, Mr. Cushing cites a personal incident:

"I have a friend in the retail business, and I have a house in the suburbs of Chicago. One winter I wanted to buy 20 tons of coal. I gave the order to my friend. His yard was in the south end of Evenston. I lived in the south end of Winnetka, 7½ miles away. The retailer took a $5000 truck and delivered those 20 tons of coal. In doing so, he drove his truck past the yards of 25 retailers and passed 35 public team tracks. On the day he delivered coal to me there was a delivery of coal from Winnetka to Evenston."

Regarding the anthracite situation, Mr. Cushing believes "it is going to stay down until autumn. We are going to have a shortage of anthracite next winter."

New Specification for Army Coal Will Embody Wage Scale Clause

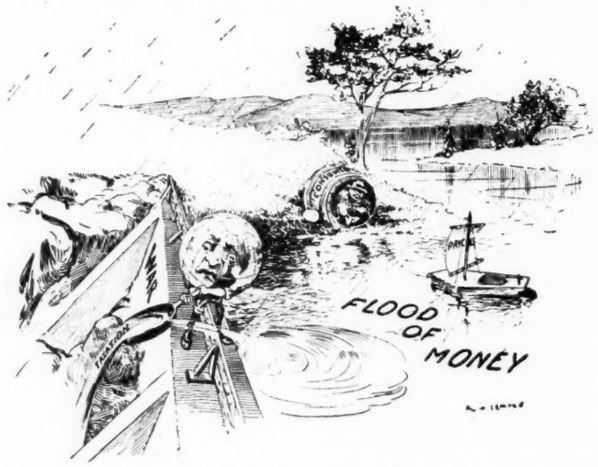
Because the War Department specification for 2,000,000 tons of coal for Army stations for the fiscal year, beginning July 1, contained no clause as to the wage scale of miners, it has been withdrawn. A new specification is being prepared which will include a wage scale clause. It is believed that the matter was an oversight and that the War Department had no idea of not recognizing a labor situation which other Government departments thought it wise to acknowledge. The contracts being made by the Bureau of Mines for fuel for the Government coal yards contain the following clause:

It is agreed that, whenever a change in the mining rate is accomplished or followed by a change in the same direction in the day-wage scale, for every cent of increase or decrease in the mining rate there shall be an increase or decrease of two cents in the price to be paid for the coal furnished under this contract; for every cent variation in the mining rate, not accompanied or followed by a change in the day-wage scale, there shall be a change in the price of the coal equaling the change in the mining rate; and should there be a change in the day-wage scale only, or should the mining rates change in one direction and the day-wage scale change in the other, the price of the coal shall be adjusted accordingly.

EDITORIALS

Still More Media of Credit

THE war added immensely to the currency and to the credit media of the nations. The world will try to ladle out the flood by making taxation large enough to gradually extinguish the debt. How large is that flood and how small is the ladle! Surely the task will be long. Meantime we have floated a further loan and increased still further the media of credit. We are even now incurring more indebtedness by the conduct, at a loss, of our railroad affairs; for that loss will have to be met either by a further loan or from taxation revenues, in which latter case it will prevent or delay the reduction of our debt. The other nations are facing a similar condition. The people are clamoring for social reconstruction on the top of the expenditures for the war. They are like the woman who, when her husband purchased an automobile, seriously crippling his financial standing, wanted to know why he did not also build her a home. The workers are saying, "If you expended so much on the wastes of war, why can you not expend a like amount on the construction work of peace or on the lowering of prices?"



CONSUMER (in the barrel)—It keeps on raining, and the old fellow makes slow progress ladling out the flood with his saucepan. A sure guess is that the good yacht "Prices" will sail even higher before long.

Because of such reasoning the nations are increasing their debts and their instruments of credit. They have programs which will make it hopeless for them to do much more than "break even" year by year. They are to be congratulated if they do not borrow further and heavily.

Thus to the stately wall of obligations erected during the war is added the flash-board built up during this reconstruction period. Will the flood subside? The better guess is that is will rather rise day by day. The small, but much deplored, national debts that preceded the war, were, as we all remember, but little reduced year by year.

For this reason we cannot expect lower prices, but may have to look with dread lest the prices rise higher than will serve merely to stabilize business.

Company propaganda is a little new. Just as the activities of the union in creating divisive sentiment were, when new, regarded as a crime, so the activities of the operator in creating a coöperative sentiment between capital and labor and emphasizing certain economic truths are regarded as offensive and improper. Yet surely the operator is justified in saying something in his own defense.

Our New Period Needs a New Press

PLAYING a popular chord is a favorite sport of newspaper men. They quite generally learn the kind of tune that takes the public ear, and they play it, whether they approve it or not. A sample of such subservience to the public taste is afforded by the following quotation from a leading Philadelphia paper.

"Petitions are being prepared, it is understood, to ask the county commissioners to raise the coal-land assessments in Northumberland County to somewhere near the real value of the properties. It is generally agreed that the present assessment of $17,000,000 on all anthracite owned in Northumberland would be entirely too low as compared with anthracite values which have advanced with leaps and bounds since the war started. If anthracite properties are to be assessed at what they are really believed to be worth, it is said, they would go up into the $10,000,000,000 or more. But this cannot be expected and if the assessment is raised to $50,000,000 it will probably be resisted in the courts.

"T. Ellsworth Davies, Scranton, mining expert, says there are 3,803,710,965 unmined tons of anthracite coal in Northumberland. Figuring this at $4, which is $2 under the lowest market price of $6 a ton, the valuation of the coal properties, it may be seen, would look like $12,000,000,000."

But why figure the value of the coal in the ground at $4 a ton when it is only rarely worth one-eighth of that price. But if it were really worth $4 as suggested, what would the capitalized value be of $15,214,843,860, payable in equal installments for 631 years and 10 months; for the coal, if all obtainable, would take that length of time to extract at the rate of production in the year before the war. Certainly, it would be prodigiously less than $12,000,000,000. All the coal that would be mined 100 years from today would have absolutely no present value, as any actuary would promptly assure us. Another consideration presents itself: The tonnage estimate is a marvelous calculation. If memory serves us, it sets the life of the anthracite region, at least of the Northumberland field, far beyond the bounds of any other estimate.

No attempt is here made to set out the actual status of the Northumberland field. That is best left to the experts who are acquainted most intimately with its conditions. All that has been done has been to indicate broadly how fallacious is the estimate of the

newspaper correspondent. No one can excuse a misrepresentation which overlooks all the many costs and puts the value of the coal under the hill at a figure $2 below the market price.

With three times as much currency as before the world war, it is easy to imagine what will happen as soon as business moves along with assurance and speed. Just now, money is not moving; but as soon as it gets active it is quite unlikely that prices of materials and labor, especially of the depressed nonunion labor, will remain at their present level.

Essentials of Bolshevism

BY REASON of his orderly, logical and careful presentation of his subject, Dr. Steinmetz, in an address delivered before the Editorial Conference, and printed on page 904 of this issue of *Coal Age*, admirably disguised the fact that he was advocating the essentials of bolshevism, which we believe are rightly defined as the advocacy of "the ownership by the worker of the tools of production." He carefully sifted out all the elements of class hatred, for such matters can find in him no answering spirit. They are not of the essentials of bolshevism, but an excrescence which is so common that we have come to regard it as inevitable.

Mr. Steinmetz does not believe in revolution but in evolution. He does not, after the manner of bolshevists, regard the manual worker as having an exclusive right to existence. His doctrine is not unlike that held by many of the largest and best of capitalists, though they might not accompany him on so long an excursion as he has taken. The system he advances might be called "industrial democracy," but it seems to go further and is in many ways safer, for an industry is better protected when the workingmen have a financial interest in its conduct than when they have merely directive powers without any financial risk to run.

The reader will enjoy Mr. Steinmetz's remarks. They sketch amazing possibilities of coöperation. Everyone would like to believe that what he has drawn is a symbol of something which may exist sometime, somewhere in the future.

The capitalist is not by any means adverse to a just and well-ordered existence when all will work together, as do the men on a college athletic team. There is no reason why, if that spirit and quality would enter into every one, any captain of industry should fear at all the advent of the industrial democracy that is being so widely heralded. If it is only like this, he will say, it cannot come too soon.

Some of us who have been on drives for the Red Cross, the War-Work Campaign, Liberty Loan, hospitals, orphanages, churches and what not, and felt with what ardent coöperation everyone—capitalist and workingman—is ready to respond to the demands of his fellow and the community, have on our return been ready to say: "Here is material for any kind of a republic—bolshevist, socialist, anarchist or what not." But, unfortunately, we are hampered all the time by the exceptional men, those who have no social spirit and in whose hearts are found only negative qualities. We could leave our doors wide open at night without fear of 90 per cent. of the passers-by. At least that portion would leave our goods wholly unmolested. What an argument for anarchy! Unfortunately, the other 10 per cent. might rifle the premises from end to end. What an argument for bolts and bars, and laws and capitalism!

Dr. Steinmetz admits that the advances should be made tentatively, and with care. He advises us to try it first on the older hands in the factory, because that is fair and prudent. Alas, the union objects to making fish of one and fowl of another. For a precisely similar reason, the union leaders are opposed to service pensions because they bind certain men to the corporation and make their interests inimical to the other men in the employ of the same corporation. Still, service pensions exist, though it is known that they do create this friction and prevent changes of employment and also cause discrimination between employees. In every scheme some faults may be found, and any scheme succeeds only if all parties approach it in the right spirit. All schemes must fail if their accomplishment is ventured in a spirit of suspicion and anger.

Unfortunately for Dr. Steinmetz's suggestion, those factories and mines that are moving along smoothly do not feel keen for so radical an innovation, even in small doses, while those business institutions that are alive with dissention are poor places in which to try it. In small concerns the difficulties are not trying enough for the owner to act, for there is always a better accord between employer and employed; and in large concerns the risks to be run are considerable, for the brotherhood feeling is hard to develop. Facts like these make experiments in bolshevism less likely than might be wished and somewhat hopeless if tried.

Industrial democracy and its associated schemes like political democracy demand not merely a new system, but a new people—men who understand economics and business, men who are open to improvements and changes, and will adapt themselves to them; an educated, coöperating and idealistic body of men. The qualities can be acquired, let that not be for a moment doubted. Democracy is a breeder of the qualities it needs for its perpetuation. It gives the strength and judgment required for its own consummation. We must move slowly upward toward a new day, whatever that day may be—a day when we shall be free as air and restrained only by our moral consciousness—anarchy—a day when we shall be regulated by the mind of the mass in every action we perform—socialism—a day of the new capitalism when every worker will own the machinery and direct his own employment—bolshevism—a day when we shall help direct our employment but not own the machinery of our trade—industrial democracy.

All the new isms are so strange and uncertain. No wonder some of us cling to capitalism with its dynamic urging toward maximum production and effort, and with its checks on unproductive operation. It is frankly based on what can hardly be called a virtue—self service—but its operation has been modified again and again by considerations of a nobler nature.

Steinmetz makes us think, and think kindly, and thoughts of this kind never are amiss. A kindly thought is in itself a revolution.

Proclaiming loudly the prevalence of graft, dishonesty and self-seeking, the advocates of industrial democracy, bolshevism, socialism and anarchy demand a new order which can only be successful if the crimes enumerated are banished from the human race and a reign of public spirit and self-sacrifice replaces ambition. Eras of trial must pass before we can hope for that consummation.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

While the labor situation seems marked only by trivial and local strikes and strike threats, and appears just now to be developing no new underlying policy, it must not be forgotten that the advocacy of the shorter day and shorter week and nationalization of mines is still proceeding. Because these aspirations do not, at the moment, cause strikes is no reason why they should not be viewed with apprehension and met by argument.

Some mine workers probably will say there should be no argument. They want both shorter time and Government ownership and they will have both or know why. They may be borne with, and with patience. The same position was at one time taken by the reactionary capitalist. "It is my capital," we have all heard him say. "They may take the job or leave it." "It is my labor," the workingman responds. "They may use it as I say or leave it." But no one can afford such an uncompromising stand. We, none of us, have the right to demand compliance to a new regulation without granting the party thus inconvenienced a parley and definite consideration. No one can lay down the law and say, "I have said so and that settles it." Neither labor nor capital must be arrogant, or the world in general which must be served by both will stand by neither, but by its own interests and rights.

ENTER THE CONSUMER, MASTER OF US ALL

If certain laboring men propose to act the drone, or profiteer, or restrict production, or oppose development, the great master, the consumer, will not brook that attitude. Only a consumer who, himself, in his employment, is already demanding equal ease, equal profiteering, equal restriction of product and is similarly opposing development will stand side by side with the laboring men in question.

We must all be citizens of a common country, working for one another, not conspiring against one another by unions and combinations to make each other pay more or receive less, unless, indeed, we happen to be victims of a real injustice, which cannot otherwise be righted.

But there are incidental items of news to record and discuss, and it is well to turn to them, as illustrating the progress of labor adjustment. On May 2, Charles P. Neill handed down a decision under which 200 contract miners of the Lehigh & Wilkes-Barre Coal Co. will receive much back pay for work done since 1917. The men had urged that they should be paid for the removal of rock in the robbing of pillars. Pillar work is, of course, less onerous than advance work. Everyone is looking for pillars to draw, and it is therefore quite the ordinary practice to let out such work without any of the compensations granted for solid mining. The company contended that when the agreement was made to compensate the men for taking rock from chambers, pillar robbing was not included.

NEILL MAKES ONE RULE FOR ROOM AND RIB WORK

However, the umpire decided that the miners in pillar work were entitled to the same allowances as men working in places which were more difficult to mine. The decision, not being before us, it may be presumed that it was based on the fact that express provision against the application to pillar work was not contained in the rate sheet.

On May 5 the umpire delivered another important decision to the effect that contract miners who were taken off their regular work for an emergency job should be paid the rate called for in their scale if the pay for the other job is less. In this mine, when two miners were pulled out to do emergency work, one was regarded as a miner and paid miner's wages and the other as a laborer and paid laborer's wages.

The umpire, however, made an altogether different ruling about those men who were called upon to perform laborers' duties in clearing away rock which fell in their own chambers. The contract miners of the Harwood Coal Co., whose scale was $3.30 per day, were paid only $2.68 for laborer's work and sought the difference; but this was denied them by the umpire. It may be pointed out that the work in question naturally fell to them. They were not chosen for the work by the company, and it was clearly one they were doing on their own behoof.

UMPIRE NOT A SHIELD FOR INCOMPETENT MEN

Mine workers cannot be expected to be reinstated in their jobs if the operators can show that they were discharged for incompetency, ruled Charles P. Neill, on May 8, in dismissing the complaint of Henry C. Singley against the Evans Colliery Co., of Beaver Meadow. Singley claimed he was promised $100 a month, but did not get the extra war allowance. The company proved that it had placed Singley in another position to that originally provided for him because he lacked experience for the job for which he had been hired, that he was finally dismissed, although paid his $100 wages while working in a subordinate capacity.

At the Drifton mine of the Lehigh Valley Coal Co. the miners have resumed work, the men being willing to leave the adjustment of the dispute to the officials and the company. On May 7 the Mount Jessup Coal Co.'s employees, to the number of 400, went on strike, leaving only the company men at work. The men claimed that their wages are being reduced, especially the wages of the contract miners. The committee denies that it has any inclination to the notions of the Bolshevists or Industrial Workers of the World. It declares, however, that whereas the wage formerly averaged $6 to $7 per day, with the reduction only $4.76 per day is earned. Torquato Natale and Giovanni Liberante are members of the miners' committee. The colliery affected lies in the storm center of the anthracite region—northern Lackawanna County.

Three hundred employees of the Racket Brook Coal Co. declared a strike on May 7 because the company refused to reinstate a motorman and brakeman who had been discharged.

FRANCOIS MINERS WANT NO RED FLAGS AROUND

Every now and again we see glimpses of the real saneness at heart of the West Virginia mine workers. Their strikes have been bitter, and the violence connected with them has, at times, aroused public apprehension. But the men are true-blue Americans, and revolutionary bolshevism and socialism with their red flags do not meet with any response from them. This was demonstrated on May 1 when some foreigners raised a red flag over their home near the Norwood plant of the Francois Coal Co., near Clarksburg, W. Va.

Patriotic miners were assembling at the company's tipple ready to march on the home of the Socialists when officers arrived and forced the foreigners to surrender the flag, which was torn to shreds. A few soldiers kept watch to see that no other red flags were raised during the day. A recent act of the legislature makes it unlawful for any person to display a red flag or even to have it in his or her possession.

For several days during the first part of May, traffic on the Kanawha River was suspended as a result of the strike among the boatmen. The shipment of coal in barges from a number of points along the Kanawha River was

consequently suspended. The boatmen went on strike because their wages were reduced a matter of $30 a month.

In our issue of Apr. 17, p. 720, appeared an article entitled "Should Binder Figure in Coal Thickness?" In it was described the difficulty in the Elkins field as to whether in arranging payment under the scale the thickness of the binder, which is not coal, should be regarded for the purposes of measurement, as if it really were coal. That difficulty still arouses opposition between the contending parties. The miners regard the binder as part of the coal, while the operators declare that the 5 ft. is for clean coal excluding binder. No agreement has so far been reached.

In Missouri, according to William H. Lewis, who is the State Labor Commissioner, there are approximately 40,000 men out of work. He adds that a large portion of these men belong to the mining industry. That, however, by no means necessarily means coal mining exclusively, for the coal mining industry is supplemented by the mining of lead and zinc. In Illinois, it is reported, 20,000 miners are out of work and 70,000 others are working only two days a week.

Labor Leader Found Guilty of Embezzlement

Emmet Moore, who had been entrusted with the funds of the local union of the Macon (Mo.) mine workers, admitted at his trial that he was short $5000 as was exhibited when the auditors went over his books. The case was tried before Judge Drain in the circuit court. Mr. Moore asked the court to allow him a few weeks to work in the mine, so that he could lay up enough money to take care of his wife and two children while serving his time.

Judge Drain allowed him until June to work in this manner, when a penitentiary term of probably five years will be passed on him. Moore has the sympathy of the men from whom he embezzled the money, as he comes of a family which now holds and will retain their respect.

The strike of the 6000 mine workers of the Central Coal and Coke Co. was settled on Apr. 26. Mr. Taylor announced that the trouble was an outgrowth of a change in the time for operating the cutting machines. Because of certain technical difficulties, the company contended that the cutting-machine force should start two hours later than the loading shift. The miners agreed that if both shifts started simultaneously, as they demanded, they would guarantee that the technical difficulty would be removed. It was so agreed.

Mr. Taylor remarks: "Dr. H. A. Garfield sent John L. Lewis, vice president of the United Mine Workers of America, here to confer with Alexander Howat, president of District No. 14 (Kansas), and John Wilkinson, president of District No. 21 (Oklahoma, Arkansas and Texas). He arrived here Tuesday (Apr. 22). I, as representing the Central Coal and Coke Co., entered the conference yesterday (Apr. 25) and this morning we reached an agreement. I submitted the understanding by long-distance telephone to Doctor Garfield, and he approved it, and in consequence the miners will return to work Monday morning (Apr. 28)."

Claim That Safety Powder Is a Handicap

But another strike is threatened in Oklahoma as a result of a dispute about the wage scale in the Hartshorne district. It is claimed that the "safety powder" used in some of the mines will not permit the men to produce as much coal as black powder. In some instances where safety powder is used the operators have raised the wage scale to make up for the decreased output per man. In the Hartshorne district no allowance is made for this. Secretary Eugene Ross is said to have remarked that the strike would not be called until President John Wilkinson, who is on a speaking tour, returns and fully investigates the grievances.

In our issue of May 1, p. 723, is recorded a mysterious strike in the Linton (Ind.) district, which resulted in the calling out of the militia and the declaration of martial law. It appears that into Linton were introduced some eight strike-breaking telephone girls to operate the switchboards of the Linton Telephone Exchange. The local Central Labor Union was believed to be taking steps to deport the girls.

A company of militia was brought to Linton from Terre Haute to take charge of the situation. Under orders of Governor Goodrich the town was given over into the charge and control of the military authorities.

When several hundred coal miners remained away from work on Apr. 29 Federal officials, fearing trouble, ordered another company of militia from Bloomington. Later the Evansville militia was ordered to aid the Terre Haute, Bloomington and Sullivan companies. Adjutant-General Smith also sent orders to Rockville for the mobilization of the militia at that place.

Some persons declared to General Smith that the miners had obtained a supply of rifles and ammunition and also had secreted whiskey which for martial weapons acts as a sure primer. This information made the officials anxious to have sufficient force on hand to insure order.

The Western Coal Operators' Association, by W. F. McNeill, their secretary, submitted a petition before the Federal Industrial Commission of Canada requesting an impartial board to deal effectively with the coal industry in the Western provinces of the Dominion. The operators backed up the secretary by the testimony of John Shanks, manager of the Brazeau Collieries; Jesse Gouge, coal operator of Drumheller, and W. S. Henderson, another operator of the same field. Mr. Henderson was quite willing to see nationalization of mines rather than an extension of the present chaotic condition, blaming the large foreign element for the frequent labor disturbances. The operators testified at length to the excellent accommodations afforded the mine workers—a long story requiring separate treatment, which will later be accorded it.

On Apr. 29 seven coal-owning peers of Great Britain began their testimony before the Government commission, Robert Smillie, president of the Miners' Federation, being the interlocutor. The commission is considering the question of nationalization of the mines and the large holdings of the coal land, the property of these peers, will be under inquiry. Among the peers are the Dukes of Hamilton and Northumberland, the Marquis of Londonderry, the Earl of Durham and Baron Dynevor.

Object to Any Wage Decrease

The men of the Clinton, Ind., field recently assembled in mass meeting and showed clearly their intention to back up the officials of their district and the international officials in the stand those officers intend to make against a reduction in wage. They believe an attempt may be made to reduce wages when the joint convention meets at the close of the war.

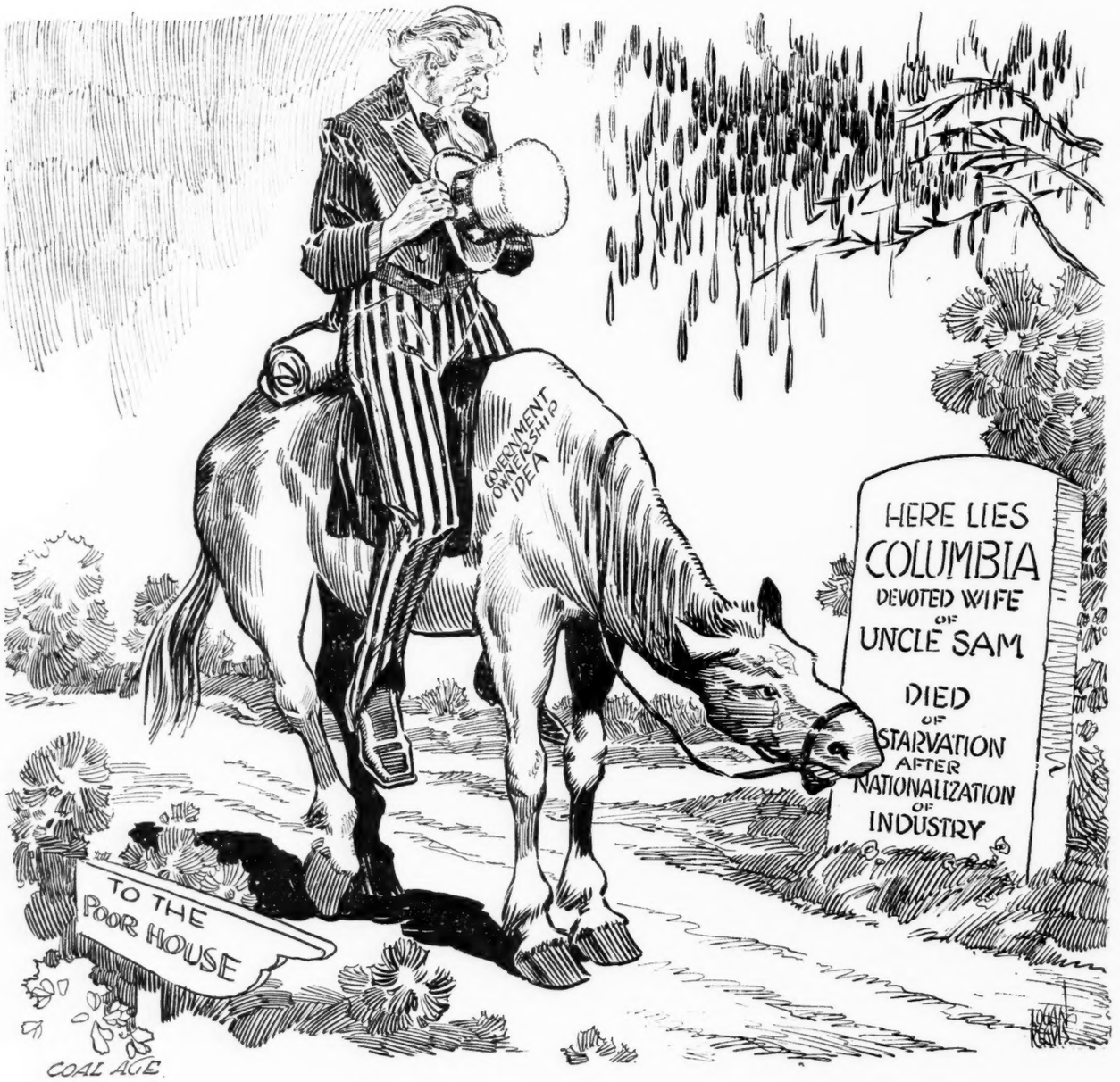
At the meeting Edward Stewart, the president of District No. 11, Secretary Mitch and Legal Counsel Harold Henderson of Terre Haute addressed the large crowd present, Board Member Jack Grange presiding.

President Stewart explained that many big users of coal are not stocking fuel as in the past, because they hope to buy cheaper coal after peace comes. These big coal users seem to expect that the operators will make an effort to reduce labor prices which were raised during the war to keep up with the high cost of living. But the mine workers announced during the war that they would not stand for any reduction, and they are sure that there is now no division in sentiment relative to that resolve. What they already have they are fully determined to keep.

Secretary Mitch declared that radicalism is much more justifiable in Russia than in the United States or Great Britain for laboring men are organized in these countries and can through these unions and the ballot protect their interests. He declared he did not believe many of the stories about the Russian bolshevists and thought a little radicalism did good, but he urged the laboring men of America to seek advancement of their living conditions by orderly, but persistent, progress.

Henderson declared that the legal department cost the mine worker only 10c. a month and was well justified because it resulted in better settlements. He urged the mine workers to refuse to sign any compensation papers unless so directed by the mine inspector, coroner or grand jury.

Over the Hills to the Poor House


GOVERNMENT OWNERSHIP IDEA
HERE LIES COLUMBIA DEVOTED WIFE OF UNCLE SAM DIED OF STARVATION AFTER NATIONALIZATION OF INDUSTRY
TO THE POOR HOUSE
COAL AGE

In three months the United States Railroad Administration has accumulated a deficit of $192,000,000, which is equal to $768,000,000 a year—about three-quarters of a billion dollars. This is more than the United States Government expended during 1916 for all lines of its work, excluding the postal service.

To put it another way, the loss in running the railroads is more than the whole cost of running the United States Government before the United States entered the war. If the Government took over all industries and they were no more unfortunate than the railroads, the loss would be about 12 billions of dollars a year.

DISCUSSION BY READERS

EDITED BY JAMES T. BEARD

Firebossess as State Officials

Letter No. 4—Regarding the suggestion of Robert A. Marshall, *Coal Age*, Mar. 20, p 544, that the firebosses in a mine should be employed by the state, permit me to say that such a proposition must always be considered in connection with the state mining laws. It is reasonable to think that, whatever changes are to be made in the function of any official, such changes must conform with the requirements of the law, which may need to be amended in that respect.

Accepting the mining law of a state as unalterable, however, and as representing the standard of perfection required for the safe and efficient operation of the mines, the fulfillment of its requirements by a fireboss or other mine official will depend on his faithfulness and efficiency, which, in my opinion, will not be affected in any way, whatever the source of the official's authority.

Firebosses appointed by the state and firebosses appointed by mine operators are firebosses still, and are charged with whatever duties regarding the safety of the mine the law may require. A faithful and efficient fireboss will perform those duties with equal sincerity of purpose whether he is employed by the company or the state.

EMPLOYMENT BY THE STATE NOT PRACTICABLE

In the opinion of many firebosses, no doubt, their work could be more effectively performed if they were enabled to act under the authority of the state. But, the fact is overlooked that, under the prevailing operation of mines by private ownership, such a division of authority is impracticable. The fact is also overlooked that, if employed by the state, the function of firebossing would practically cease, as that official would then be acting virtually as an assistant to the mine inspector.

It appears to me that the employment of firebosses by the state would call for a similar employment, by the state, of all mine managers (foremen) and overmen (assistant foremen). This would mean, practically, the placing of our mines under state control.

By the present system, a fireboss is the "competent person" appointed by his employer, the mine operator, to carry out certain requirements of the mining law. Both the employer and the fireboss are then directly responsible to the state for the proper discharge of the latter's duties. The fireboss is simply a mine official acting under the authority of the state law and assisting the management in complying with the law.

On the other hand, as a state official, the fireboss would be the "competent person" appointed by the state to see that the requirements of the law were fulfilled in the operation of the mine. The state and the fireboss would then be directly responsible for the safe operation of the mine.

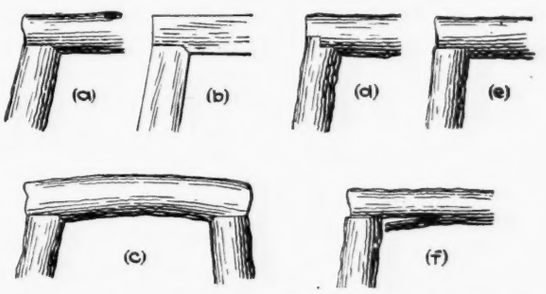
In conclusion, let me say that my contention is that the position of any mine official cannot be considered intelligently apart from the mining law under which he is acting, and I hold with Mr. Marshall's opinion that a fireboss should not be considered in any other capacity than that of a mine examiner.

Ladysmith, B. C., Canada. W. WESNEDGE.

Safety in Mine Timbering

Letter No. 1—I was much interested in the short article of Joseph R. Thomas, illustrating the right and wrong method of timbering in mines, *Coal Age*, Feb. 20, p. 349. I quite agree with Mr. Thomas that wrong methods of timbering have been the cause of many mine accidents resulting in great loss of life. On this account, there is growing need of more experience in the proper method of notching the collars and framing the legs to fit these notches in a timber set.

Referring to the illustration giving the right and wrong methods of notching timbers, in Mr. Thomas' article, permit me to say that I cannot agree with him that his Fig. 1, page 349, is a proper form of notch, as it does not give opportunity to develop the full strength of the timbers. In the accompanying figure, I have



RIGHT AND WRONG METHODS OF NOTCHING TIMBERS

shown the proper form of this notch, which gives a full bearing of the collar on the top of the leg. I like to call this a "slope" or "Welch" notch. The same notch is employed whether the timbers are round or unhewn as at *A*, or square or sawed timbers are used, as shown at *B*.

When it is possible to obtain a curved timber, the arched form of collar shown at *C* will give a greater strength than where a straight collar must be used. Here also I have shown the same form of slope notch just described.

Formerly, some timbermen employed the double notch shown at *D*. This, however, is not as strong as the slope notch, as the collar or crossbeam has to be hewed deeper to fit the second notch. The idea was to give a little greater resistance to side pressure, by providing a second notch.

The square notch shown at *E* is a wrong method of framing the timbers of a set. This form of notch is very apt to result in splitting the collar as shown at *F*. The slope notch first mentioned not only gives greater strength, but acts to prevent the splitting of the collar. To my notion, also, the slope notch is easiest

made and takes less time. In notching timbers, care must be taken to give a true bearing on the top of the leg, in order to develop the full strength of the set.

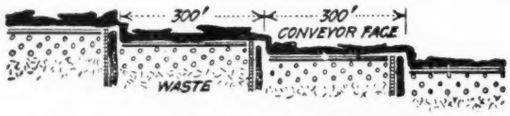
Terre Haute, Ind. JESSE HAMILTON.

Roof Conditions in Longwall Work

Letter No. 1—I am glad to respond to the invitation to answer further the inquiry of "Sandrock," which appeared in *Coal Age*, Mar. 27, p. 591, and presented the proposition of working a 3-ft. 4-in. coal seam, by longwall. The seam is described as being underlaid with 3 ft. of fireclay, while the roof consisted of 9 in. of hard sandrock overlaid with 3 ft. of soapstone, above which was more sandrock. I wish to give a little of my own experience and offer a few suggestions.

In 1906, I was superintending a mine in Derbyshire, England. The seam was known as the "High Hazel Coal," and the conditions were such as to be practically identical with those mentioned in this inquiry. From the experience gained in that field, I have no hesitation in recommending the use of the longwall system of mining in the present case.

The work should be carried forward in 300-ft. sections, separated by roadways. Each section formed a conveyor face and was kept a few feet in advance of the



SECTION OF LONGWALL CONVEYOR FACE

face next succeeding, so that the entire longwall face represented a series of steps, as I have indicated in the accompanying figure.

In driving the roads, the plan should be to take up the 3 ft. of fireclay underlying the coal and use it in the packs. Also, the roof should be ripped and the 9 in. of hard sandrock taken down and used for building the roadside packwalls, this being splendid material for that purpose. Taking up the 3 ft. of fireclay bottom will not only prevent the heaving of the roadways should the fireclay become wet, but the tracks will thus be lowered a sufficient distance under the loading platform of the conveyor to enable the coal to be loaded at once into the cars standing beneath the platform.

Allow me to suggest, here, that it is a good plan to drive a 20-ft. roadway, at the end of each conveyor face. This will allow ample space for building a good packwall on one side of the track and leaving an air-course behind the packwall, between it and the rib of the next section.

PRECAUTIONS IN TIMBERING A LONGWALL FACE

In order to obtain the best results in controlling the settlement of the roof, there should always be three rows of good props or posts set staggered behind the conveyor, or between it and the waste, as shown in the figure. If the floor is soft, these posts should be set on footboards. No timber should be permitted to remain standing in the waste when the back row of props is moved forward. In no case should the foot of a post be sunk in the fireclay, as that will always make trouble if the fireclay is soft. Should the condition of the soapstone roof be such as to require cogs, these should be built on a bed of slack 10 or 12 in. in thickness, the purpose being to insure the easy removal of the cog timbers as the face advances.

A "Sylvester post-puller," having a long chain, is ideal for this work, as the men doing the job are then well protected from roof falls. If the roof hangs for a considerable time after the back timbers have been withdrawn I would suggest making a good fall, back in the waste, about the middle of the face. For this purpose, it may be necessary to place one or more good shots in the roof.

In the foregoing I have taken it for granted that there is no seam of coal to be worked above the one mentioned. Should that not be the case, however, and it is necessary to provide for the future working of an overlying seam, I would drive a pair of roadways on 42-ft. centers. This plan should also be followed where there is danger of unsteady work, as at the present time.

In the working of the High Hazel Coal, at Derbyshire, we tried a section by driving roadways on 42-ft. centers and building 12-ft. packs on each side of the roadway and ripping the top, instead of lifting bottom as I have suggested here. In that case, the fireclay left in the bottom heaved so badly that the roadways were completely blocked, at intervals of two or three weeks.

Our experience has proved that taking up the fireclay bottom eliminated the danger of the heaving of the floor of the roadway, and the best results were obtained by driving a single roadway at the end of each section or longwall conveyor face. When this bottom was taken up, the water naturally drained from the fireclay in the waste, and there was no heaving to cause any trouble. In the present case, if the plan I have suggested is adopted and superintended by a good man experienced in longwall work, I am convinced that it would be successful. ANDREW ORR BAIN.

McKeesport, Penn.

Letter No. 2—Referring to the proposition presented in the inquiry of "Sandrock," *Coal Age*, Mar. 27, p. 591, allow me to illustrate clearly the condition that is set up in the overlying strata, in longwall work that is properly conducted—a condition that serves to protect the roadways and prevent them from being closed by the settlement of the superincumbent strata on the roadpacks. The closing of the roads is one of the common difficulties encountered in this system of mining.

In order to make my meaning clear, I have drawn the sketch shown in the accompanying figure, which repre-

CROSS-SECTION A SHORT DISTANCE BACK FROM FACE

sents a vertical cross-section taken at right angles to the roadways approaching the face, but sufficiently far back from the face to show the final settlement of the roof on the packs.

It will be observed, as shown in the figure, that as the roof settles down solid on the packs, which must be well built, there is formed a kind of locking action of the roof strata. When this settlement has gone so far that the packs are squeezed into a thoroughly solid mass having almost the solidity of the rock itself, the roadside packs begin to feel the strain. But, at this

point, the locking action of the strata that I have mentioned causes the arching of the strata over the roadways, which protects them from being crushed by the great weight of the overburden.

In the present case, the 9 in. of hard sandrock overlaid with only 3 ft. of soapstone and then more sandrock makes a roof that will be hard to break as it settles on the packs. Certainly, as *Coal Age* has already stated in its reply to this inquiry, it is far better that there should be no break, but that the roof should settle gradually down on the waste. If the packs are well built, however, they will act to cushion the superincumbent weight and cause a gradual settlement, which will generally prevent a sudden break that would not only disturb the roadways but cause other trouble and delay the work.

Danger of Break Occurring in a Longwall Roof

Of course, there would be no objection to a break occurring in the roof, at a great distance back in the waste, where it would not affect the roadways or conditions at the face. However, should this occur, there must be plenty of strong wood chocks to prevent the break from extending to the roadways and the working face.

Stout timbers should be used as posts, the length of a post, in feet, not exceeding its diameter in inches. In other words, the diameter of the post should not be less than one-twelfth of its length.

Where the roof conditions were such that I had reason to fear that a break would occur to damage the workings unless something was done to bring down the roof in the waste, my plan was to drill holes in the roof, at or near the working face, long before such holes had to be shot. The holes should be charged and shot, only when they have receded a sufficient distance back of the timbers, in the waste.

The shooting of these holes would cause a roof fall in that area, which would relieve the pressure on the roadpacks. In closing, however, let me say that such an attempt to break the roof in the waste should never be made if it can be reasonably avoided, as will appear from the evident condition of the roadways and roadpacks. The latter will show when the strain on them is too great, and it is then that it will be necessary to break the roof by some means such as I have mentioned.

W. H. Luxton.

Linton, Ind.

Perils in Reconstruction

Letter No. 7—Speaking of the perils in the work of reconstruction following the great war, these do not appear to me as great as many seem to think. To my mind, they are overbalanced by the opportunities that are now offered to the average citizen in this country. These opportunities were never greater than at the present time.

The presence of such a large number of foreign-born citizens in America is one of the best testimonials to the fact that these appreciate the opportunities offered them. They have come here, primarily, to better themselves, and have found wages, living conditions and opportunities for their improvement so good that they have sent work back home and others have followed them across the great pond.

Because a few young Americans are profligate of their opportunities, live beyond their means and fail to accumulate money or property is no proof that the opportunity to do this is not present. America is, in some degree, a land of wasted opportunities, but these are here and within reach of all who will help themselves. I am glad to say that a large majority of persons living here do accumulate wealth and enjoy the blessings of life and the prosperity that this country offers in greater abundance every year.

Different Types of American Citizens

Let me attempt, briefly, to classify men in three types, respecting the use they make of their opportunities: First, there is the man who enjoys the average degree of health, both of himself and his family. Every young couple who are thus blessed with health can, with reasonable care and industry, quickly save enough to own their own home and accumulate other assets such as Liberty Bonds and stocks in paying investments. If their choice lies in that direction, they can, besides, soon own and enjoy the luxury of an automobile, without indulging in the doubtful experiment of buying it on the installment plan.

A second type of individual is represented by the lavish spender, who is blessed with the same good health and to whom the same opportunities are open of accumulating wealth. Instead, however, of adopting the pay-as-you-go plan, in respect to personal and family expenses, and laying by their small savings until they are able to purchase what they desire without burdening themselves with discouraging debts, this young couple become impatient. At 25 or 30 years of age, they want the same luxuries that their parents were able to enjoy only at the age of 45 or 50. With this class, homes are bought and heavily mortgaged; automobiles are purchased on the installment plan; and these pleasure seekers continue to struggle along under heavy burdens that eat up their small income as fast as it appears. The result is that they become discouraged and their chances for future happiness and contentment are sadly marred.

The Handicap of Ill Health

Finally, there is the third type represented by the man who must struggle along under the incubus of ill-health, either of himself or his family, or both. Truly, this type needs our sympathy. Their small savings are swept away by the expense of doctors' bills, hospital charges, medicines, and other necessities. We can hardly say that the same opportunities for the accumulation of wealth and property are open to this class of unfortunates.

I might mention a fourth type, which, however, is rare. It is represented by the individual who, though not particularly characterized as industrious or saving in his habits, is obviously lucky. Everything seems to turn into money in his hands, not so much because of his ability; it seems to be pure luck or chance. There are, of course, a few far-sighted and exceptionally good business men who manage to accumulate wealth in a few years that other hard working, industrious people are unable to save in a lifetime. It is these exceptional cases of lucky ventures and business ability that give rise to the complaints so often heard of "unequal opportunities."

In striking a general average, the unfortunate, struggling class that I have mentioned are offset by the fortunate and lucky type. But, certainly, the average man and family in America fare well; and it is only a

minor percentage of men who fail to accumulate a reasonable competency whereby they are able to maintain a higher grade of living than is generally possible in other lands.

Let me suggest that young people, and especially young couples, both American-born and foreign-born, starting in life, will do well to think seriously of the opportunities that are before them. All right-minded native and foreign-born citizens alike, I believe, do appreciate these opportunities to a marked degree and refuse to be led by the attempts to malign and underestimate the best country on earth. America is not without her faults, but they are far outweighed by her many virtues. Let us, then, look at the brighter side and cooperate with Uncle Sam to make this country what it ought to be, the chief among the nations.

Clinton, Ind. FOREIGN-BORN CITIZEN.

Letter No. 8—Concerning the future of America, many people are under the impression that, as soon as peace is assured, there will be an exodus of labor from this country that will affect the mining of coal more than any other industry. In this connection, kindly allow me to recite, briefly, a few interviews I have had recently with prominent foreigners in this locality.

On each occasion, I would put the matter squarely before the person, by asking a direct question, the answer to which would reveal the man's attitude in respect to his choice between this country and his homeland. Following are a few of these interviews:

Now that the war is over, if a suitable government were to be established in your own country, the same as that in the United States, would you go back there to spend the remainder of your days?

To this question the common reply was as follows:

I have three, four, five or six children born in this country. They have not only learned the English language, which they speak, but are getting an education here that they could not get if they were to be taken back to where I was born. They would not have, there, the same opportunities that they have here in America.

INHERITANCES OF FOREIGNERS UNCERTAIN

Again, talking with others concerning the land or property that they were likely to fall heir to in the old country, I would ask:

Have you given any serious consideration to the question of going back and taking possession of this property that will be yours?

In answer to this question, the man would invariably reply:

It is true that my father had a large farm before the war, but everything may now be gone. The place is undoubtedly run down; it would require lots of money to start all over again and maybe it would never pay after all. No, we would rather stay in America, because we know that the money we have been able to save here would be largely spent in going back and starting life over again in the old country and, in so doing, we would be deprived of many pleasures that we now enjoy.

Again, speaking of the wage question, I would often ask:

Supposing that your country would offer you wages more than what you receive in this country, and gave you good assurances and inducements to return home, and these assurances appeared good to you, then what?

After some hesitation, the answer would come about as follows:

Well, you see it is like this: The wages and inducements to return might appeal to me and some others; but the most of us would conclude that there are other things to look at and consider. For instance, our children are born here in America. They are growing up and have become attached to this place. Whenever we mention to them anything about going back to the old country, for the purpose of testing their feelings in the matter, they say, "You can go if you will, but we are Americans and will stay here where we were born."

ATTITUDE OF THE FOREIGN-BORN TOWARD BOLSHEVISM

In addition to these personal interviews with many of our foreigners, let me cite further a conversation I overheard between a few foreigners only the other day. They were discussing the form of government proposed by the Bolsheviki element. One of the speakers said with emphasis:

There is no need for such a form of government, as long as wages remain within reason and men can work every day so that they can provide their families with the necessities of life. If capitalists in this country realize, which a good many of them do, that all the working man wants is an honest living, things are bound to move along smoothly. But, once they begin to increase their profits and squeeze the working man, they will sow the seeds of discontent and the two elements will be at loggerheads and strikes and lockouts will follow, which will give Bolshevism a start."

The war has revolutionized the world and capital and labor have coöperated on the same level to win the victory that is ours today. Both of these elements have been brought closer together at terrible costs. If they coöperate now as they did in the war, there will come the time that both will go hand in hand to accomplish whatever they undertake.

As far as the coal-mining industry is concerned, wages appear satisfactory to the majority of the men; but should the attempt be made to lower wages, without a reasonable reduction in the cost of living, we would face a dangerous situation. There are intelligent foreigners who are able to influence and sway their fellow countrymen. It is when these, who are more intelligent, feel rightly that they are hard pressed that the greatest danger arises in respect to labor and its relation to capital. Common sense and feeling for others must prevail in order to secure coöperation and prosperity. LEWIS R. THOMAS.

Edwardsville, Penn.

Efficiency of Mine Officials

Letter No. 9—Since this discussion was started by William Gorman, *Coal Age*, Jan. 16, p. 159, I have been wondering how much of the good advice offered in these letters mine officials will take to themselves. Every mine official from the president down is efficient in his own estimation, and only in the eyes of the close observer is their inefficiency apparent.

While this is a general rule, there are, of course, notable exceptions. Wonder has been expressed that any mine management should select a barber, a store clerk, an accountant or other trade worker to fill a responsible position in the operation of the mine, and mistakes have been made, undoubtedly, at times, in this direction.

It is a trying ordeal for a mine foreman to feel that his boss, the superintendent, is a man with whom he cannot discuss mine matters on a broad practical basis, because of the latter's lack of experience in coal mining. I recall one instance where a clerk was taken from

a store and placed in charge of three mines, as superintendent. On receiving an order for certain supplies for one of the mines, the new superintendent called up the foreman and demanded to know what he was going to do with "cap-pieces." The foreman's explanation of their use in the mine left the superintendent still in doubt as to whether the foreman was not putting one over on him as a joke.

A mine superintendent must know the mining business from A to Z and be able to decide the class of equipment that is best fitted for the conditions with which he has to contend. Most mining men will agree that mine equipment and supplies are the chief factors in producing cheap coal. The proper location of the surface plant, distribution of power, arrangement of tipple and hoisting and haulage systems adopted are other important factors. But *cars, oh, cars!* It is truly disheartening when one thinks of the numberless types of mine cars in use, many of which are ill-adapted to the conditions existing in the mine where they are to be used.

Inspection by an Efficient Superintendent

Perhaps nothing will be more instructive, in this connection, than to follow one efficient superintendent about, on the occasion of his first tour of inspection after taking charge of a mine. Early Monday morning finds him entering the engine room. His cordial greeting is followed by a few direct inquiries, and the engineer explains that "No. 3 boiler was cut out yesterday and found to be so thickly coated with scale as to require much hard work before it can be fired again."

The superintendent remarked that the cost-sheet had informed him of the trouble, and, walking into the boiler room, he at once secured a sample of the scale for analysis. This done, he continued, "Now, John, can you suggest any other trouble here?" The answer came quick, "Yes, our coal is the 'road cleanings,' a mixture of fine coal, bone, slate, sand and clay. We are charged with good coal, but that is what we get, and the cinders that form make it necessary to clean the fires too often to get even fair results."

The superintendent then asked to see the flues, and John opened the door exposing the ends of the boiler tubes and the flues to view. These were found to be thickly coated with soot. In reply to an inquiry, John said the practice was to clean the flues once every two weeks; but promised, hereafter, to clean them twice a week. Further inspection showed steam escaping from leaky pipe joints and valves. In the generator room, sparks were flying from the commutators and the voltmeter indicated from 150 to 175, instead of 250 volts, of all of which the superintendent made mental note and, after a little private talk with the engineer, left the place and proceeded to the tipple.

A Trip Through the Mine

The first thing that caught the superintendent's eye at the shaft head was the wasteful manner of oiling the mine cars as they came out of the mine. Two boys stood, one on each side of the track, and as the cars passed they squirted oil at the car wheels. The rails and timbers were literally smeared with oil. He did not linger here, however; but, calling for a lamp and empty cage, was lowered to the shaft bottom where he found the foreman waiting for him. His greeting was, "Hello, James, how are you? You said something about poor ventilation and I want to see what is the matter."

Passing through a door at the shaft bottom, on the way to the air shaft, the superintendent noticed that the door was poorly hung and that it swung the wrong way so that it leaked much air. Further on, passing up the main airway, stoppings were observed that were poorly built and also leaked air. Breakthroughs were small and obstructed with loose coal, and tool boxes often stood in them. Canvas curtains were used to deflect the air, instead of doors. The result was that, practically no air reached the face.

But ventilation was not the only thing that interested this observant superintendent, on his first tour of the mine. Waste of supplies and material was evident everywhere. Rails, props, ties, boards, canvas, spikes and nails were scattered here and there along the entry. Reaching a place where the men were drawing pillars, rails were seen partly buried under a fall of rock.

At another place, workmen were busy tearing up rails, leaving the spikes where they were drawn. James explained that they would go back later and pick them up; but the superintendent's suspicions were now fully aroused and he pushed on, going further into this place that had been abandoned. Here he found curved rails, parts of switches, timbers, track ties and spikes, all of which should have been gathered up and used again. In another place, a keg of spikes was found, three-quarters full, standing by the track. James explained that it was the custom to set a keg of spikes around, in that way, where they would be handy.

The Young Foreman Given Another Chance

The foreman, James, was a young man. It was his first position as mine foreman and he had been there but six months. In view of these facts, the superintendent decided to talk matters over with him and give him another chance, believing that he would be able to make him a good foreman. Before leaving the mine, therefore, he took James into his confidence, told him his plan and instructed him to rebuild his doors and stoppings, clean up his airways and remove all obstructions from breakthroughs, besides gathering up all waste material that was scattered about the mine.

One feature that was characteristic of this superintendent was his fairness. He treated all men alike, but referred all their complaints to the foreman. He would not tolerate a news carrier. His foreman was the man on the job. In my opinion, a superintendent's success depends on organization. While he must have a system, it should not be an ironclad rule, not to be broken. Neither should it be too flexible. He must have a complete working plan extending from his office throughout the plant to the trapper boy.

We have all heard of the "white-collar" efficient superintendent. I know one of that type that produced cheap coal for a short time, coming on the job when there was a full supply and plenty of everything needful in stock. During his two years of office, he required little new material. He ran the mine so short of supplies that his foreman was obliged to take rails from one part of the mine for use in other sections where they were needed at once. Tracklayers would spend half a day at a time running through old works with a spikebar and bucket, hunting enough spikes to lay a switch, and spikes were frequently drawn from the main track to help out. These are facts gleaned from my own experience, in charge of mines.

Osceola Mills, Penn. S. D. Hainley.

INQUIRIES OF GENERAL INTEREST

ANSWERED BY JAMES T. BEARD

Working an Old Mine

I am writing to ask for some information and advice in regard to one of the old mines still working in this vicinity. The situation is about as follows:

The coal in this mine is 5½ ft. thick and very soft, so that it is easy to roll off the ribs on the butt entries. Overlying the coal is a tender stone, which varies from 1 in. to 6 ft. in thickness, in different parts of the mine. The roof strata above this stone may vary from 10 ft. to 100 ft. in thickness, while the entire overburden reaching to the surface has an average depth of 1500 feet.

The mine has been opened on an eight-entry system, from which cross-entries were driven to the right and left and butt headings turned off these, parallel to the main heading. This is an old mine and the distance from the entrance to the main butt headings, now working, is about 7 miles, while the distance measured across the mine, from the face of the crossheadings on one side, to the same on the other side of the main entries is about 5 miles.

From time to time, there has been considerable trouble due to the development of a squeeze in the workings. I would like to ask what would be a fair thickness of the barrier pillars that should be left between the butt headings and the main-line entries, for their protection? Also, what thickness of room pillars should be left when driving the rooms off the butt headings? Again, is there any way of stopping the progress of a squeeze that has already started, besides pushing the extraction of coal in that section of the mine where the weight is coming?

In the advance workings of this mine there have developed a few small gas feeders, and I want to ask if there is any danger of an explosion occurring on this account. How much air should be kept in circulation in abandoned workings generating a little gas.

Benham, Ky. STRAWBOSS.

One can form only a general idea of the situation in this mine, from the description given, which would seem to warrant the assumption, however, that there is some danger present that would call for the need of much practical experience and the exercise of good judgment in all future operations. The circulation of air, in every part of the mine, should be sufficient to keep all the working places, roads and travelingways free of gas. Each section should have its own ventilating current or air split.

All abandoned areas must be ventilated thoroughly or sealed with substantial air-tight stoppings. The thickness of barrier pillars flanking the main headings should not be less than 100 ft. Where rooms are driven 6 or 7 yd. wide, under the conditions mentioned, the thickness of the room pillars should not be less than 40 ft., making the room centers about 60 ft. The work should be in charge of an experienced foreman and examined frequently by competent firebosses.

When a squeeze has developed and gained much headway in a mine no amount of timbering can stay its progress, under 1500 ft. of cover. The only remedy to apply is the rapid extraction of pillars and the drawing of all timber that is still standing in adjoining and abandoned areas, so as to cause a good fall of roof. A few shots placed in the roof at chosen points will often prove effective in producing the desired result.

Gangway Driven in a Basin

Kindly give me a little information in regard to the best method of drawing pillars under the following conditions. The main gangway of our mine is driven in the basin of the seam, which pitches north and south, on each side of the gangway, the inclination being from 35 to 45 deg. Rooms have been driven to the pitch on each side of this gangway and extended to the outcrop or drift, which is composed of stones and clay.

Our problem is how to recover every pound of pillar coal possible and use as little timber as will make the work safe. The width of the pillars varies from 15 to 18 ft. and the length from 100 to 135 ft. The thickness of the coal varies from 10 to 16 ft. At times, the coal works very free and, again, it is quite hard. We have used almost too many props and double timbers on the roads, and yet have not been entirely successful in supporting the roof. What we desire is to get the opinion of *Coal Age* and its readers in regard to the best means to employ to recover the largest amount of coal in drawing back the pillars. LUZERNE.

———, Penn.

This inquiry is a fair sample of many that come to *Coal Age*, from correspondents expecting to receive some helpful suggestion or advice, but omitting to give the most essential data affecting the proposition. As a rule, these incomplete inquiries are ignored or sent back with a request for more information that would enable an intelligent answer to be given. We present this proposition, however, just as it has come to us, believing that this will do more to show the need of correspondents stating all the conditions surrounding the case when asking for help.

Before any answer can be given to this inquiry, it must be known what is the depth of cover and character of the strata, overlying the seam, nature of the floor, width of rooms, etc. The inquiry should be accompanied with a sketch showing both the plan of the workings and a cross-section taken at right angles to the gangway.

It is not necessary to state, here, that the mining of coal in a seam varying from 10 to 16 ft. in height and pitching from 35 to 45 deg. is attended with danger, and will require the utmost of skill and experience to insure safety and avoid accidents. We shall be glad to receive any suggestions or information that our practical readers feel disposed to give, in respect to drawing pillars on steep pitches. It will be necessary, however, to assume conditions conforming to mining practice.

EXAMINATION QUESTIONS

ANSWERED BY JAMES T. BEARD

Bituminous (Penn.) Mine Foremen's Examination, Apr. 8-10, 1919

(Selected Questions)

Ques.—What measures would you take to secure the best possible results from a fan, the capacity of which is limited and the demands upon which are close to its capacity?

Ans.—Clean up the airways and remove all obstructions to the flow of air, by enlarging the breakthroughs and crosscuts so that they will have the same sectional area as the airways. Wherever possible, shorten the course of air travel and split the air current wherever this can be done to advantage.

Ques.—In a shaft 300 ft. deep, an entry 7 ft. high and 10 ft. wide is turned off from the bottom. The shaft is full of water and overflowing. What is the pressure per square inch and the total pressure, in short tons, on the face of the entry?

Ans.—The static pressure due to a 300-ft. head of water is $300 \times 0.434 = 130.2$ lb. per sq.in. The total pressure on the face of this entry is therefore $130.2 \times 144\ (7 \times 10) \div 2000 = 656.208$ short tons.

Ques.—What dangers may arise from bituminous coal dust, in dry and dusty, nongaseous mines, and what precautions would you take to insure safety?

Ans.—The dry finely powdered dust of bituminous coal is often highly inflammable and easily ignited when suspended in the mine atmosphere. This is liable to happen when accumulations of dust are allowed to gather at the working face, particularly where the coal is blasted after being mined with machines.

To avoid the danger arising from the ignition of a cloud of dust, all fine coal and dust must be loaded out and not permitted to accumulate in the rooms. Strict regulations must be made and enforced, in regard to blasting. The safest plan is to employ shotfirers who are competent men and whose duties would be to inspect, charge and fire all holes drilled by the miners. The shotfirers should be authorized to refuse to charge and fire such holes as, in their judgment, are unsafe. The work of the shotfirer should be done after all the men have left the mine.

Ques.—In an airway 5 ft. wide at the top, 10 ft. wide at the bottom and 6 ft. high, the anemometer reads 280 ft. per min.; what is the quantity of air passing per minute?

Ans.—The average width of this airway is $\frac{1}{2}(5 + 10) = 7.5$ ft., and its sectional area $6 \times 7.5 = 45$ sq.ft. Then, assuming that the given anemometer reading has been taken in a way to obtain a fair average velocity of the air current, the quantity of air passing in this airway is $45 \times 280 = 12{,}600$ cu.ft. per min.

Ques.—What is the purpose of stoppings and what materials would you use in their construction, in nongaseous mines?

Ans.—The purpose of mine stoppings built in the crosscuts or breakthroughs, in entry pillars, is to prevent the air from short-circuiting at such points and conduct it forward to the last crosscut at the head of the entries. Stoppings are also built in entries or other passageways or airways to close off or seal such openings, in order to prevent the escape of any gases that may be generated in such places.

Stoppings in mines should be built of incombustible material, such as refuse stone or slate, brick or concrete. Temporary stoppings are often constructed of a double wall of slate, having the space between the two walls filled with sand or road dirt to prevent the leakage of air through the stoppings. When well built, this makes a good temporary stopping. The permanent stoppings on the main haulage roads, in a large mine, should be built of brick laid in cement, or concrete.

Ques.—Of two airways, intake and return, which, in your opinion, should be the larger? State fully.

Ans.—When considering ventilation alone, the answer to this question should state that the return airway should always have the larger sectional area, because of the increased volume of the return current, which has a higher temperature and contains varying quantities of gas generated in the workings. The volume of the return current is also expanded somewhat by the relief of the pressure due to the mine resistance, as this pressure is always greater on the intake than on the return airway.

However, there may be conditions to be considered, when driving the main haulage roads and airways in a mine, that would call for a larger sectional area to be provided on the haulage road, to make necessary allowance for the obstruction of the air current by reason of the presence of loaded and empty cars that are constantly being hauled out and into the mine. Also, allowance must generally be made for a safe clearance at the side of the track, on all haulage roads.

Taking these considerations into account, in a mine where haulage is performed on the return airway, there is hardly a doubt but that this airway should have the larger sectional area. This is commonly the case in nongaseous mines. In gaseous mines, it is the usual practice to make the intake airway the haulage road, and, in that case, the sectional area of this airway may require to be equal to if not greater than that of the return airway.

Ques.—What is the capacity of a double-acting plunger pump, if the plunger is 20 inches in diameter, stroke 40 inches, and revolutions per minute 25?

Ans.—The sectional area of the plunger is $0.7854 \times 20^2 = 314.16$ sq.in. Multiplying this by the length of stroke (40 in.) and dividing by the number of cubic inches in a gallon (231) gives for the plunger displacement, each stroke,

$$(314.16 \times 40) \div 231 = 54.4 \text{ gal.}$$

At a speed of 25 r.p.m., a double-acting pump makes 50 strokes per minute, and the plunger displacement is therefore $54.4 \times 50 = 2720$ gal. per min. Then allowing 85 per cent. efficiency at the water-end, the discharge of this pump is $0.85 \times 2720 = 2312$ gal. per minute.

FOREIGN MARKETS AND EXPORT NEWS

EDITED BY ALEX MOSS

Survey of the Export Coal Trade of Great Britain

[British (Government) *Board of Trade Journal*, Mar. 13, 1919.]

The British export coal trade, like all British industries, was for over four years organized entirely for war purposes. Not only was the total production of coal seriously reduced by the enlistment of large numbers of skilled miners, not only were important markets cut off by military operations, but the export trade to such markets as were still open was governed entirely by naval and military considerations. Export to France was increased and the needs of Italy were met as far as shipping facilities permitted. Large shipments of coal were made to naval strategic points. On the other hand, distant markets, like South America, were almost entirely sacrificed.

That past condition of things has now to be reversed. How far that is possible depends upon factors which can be indicated but not measured. Much depends upon the state of Europe within the next few years, upon whether it is disturbed or peaceful. Much depends, too, upon the effective competitive power of those countries, which, owing to the special circumstances of the war, and particularly owing to war prices, have been able to enter markets formerly closed to them. It is unnecessary to emphasize the importance of the coal export trade both in itself and in its relation to general commerce; in bulk it is by far the greatest of British exports, and it enables food and raw materials to be imported at cheap return freights. If it is reduced, general commerce will be proportionately hampered.

It is not the purpose of this article to provide answers to the numerous questions that arise, but to furnish some of the materials necessary for answers. In the various tables that follow, the course of the export trade during the war is shown, and the situation at the beginning is contrasted with that at the end. It will be seen not only how the trade has changed as between countries, but also as between classes of coal, and this will help the estimation of the chances of recovery. The progress of the new exporting countries is also discussed, and, finally, particulars are given of the export coal trade of Germany, the United Kingdom's greatest rival in 1913.

Production and Consumption

The British production and export of coal during the six years, 1913-1918, have been as follows (in long tons):

Year	Production Tons	Export Tons	Bunkers Tons	Left for Home Consumption Tons
1913	287,430,000	73,400,000	21,032,000	192,998,000
1914	265,664,000	59,040,000	18,536,000	188,088,000
1915	253,206,000	43,535,000	13,631,000	196,040,000
1916	256,375,000	38,352,000	12,988,000	205,035,000
1917	248,499,000	34,996,000	10,228,000	203,275,000
1918	227,987,000	31,753,000	8,756,000	187,378,000

It should be noted that coal retained for home consumption includes coal for naval and military purposes as well as coal for industrial and domestic uses. The bunkers on former merchant ships taken by the Admiralty are covered among naval purposes.

The trend of things may be shown by expressing the figures for 1914 and subsequent years in percentages of 1913:

Year	Production Per Cent.	Export Per Cent.	Bunkers Per Cent.	Home Consumption Per Cent.
1913...	100.0	100.0	100.0	100.0
1914...	92.4	80.4	88.1	97.5
1915...	88.1	59.3	64.8	101.6
1916...	89.2	52.2	61.8	106.2
1917...	86.5	47.7	48.6	105.3
1918...	79.3	43.3	41.6	97.1

Coal is also classified for export purposes according to its uses, and the particulars are as follows:

Year	Anthracite Tons	Steam Tons	Gas Tons	Household Tons	Other Sorts Tons
1913	2,976,000	53,619,000	11,528,000	1,770,000	3,507,000
1914	2,389,000	42,634,000	10,080,000	1,490,000	2,447,000
1915	2,227,000	31,151,000	7,275,000	1,041,000	1,841,000
1916	2,000,000	27,890,000	6,469,000	377,000	1,616,000
1917	1,384,000	28,322,000	3,700,000	152,000	1,438,000
1918	1,162,000	26,050,000	3,081,000	149,000	1,311,000

The particulars furnished with regard to production do not permit a comparison to be made with the kinds of coal exported except in the case of anthracite, the production of which was: In 1913, 5,195,000 tons; 1914, 4,719,000 tons; 1915, 4,712,000 tons; 1916, 4,644,000 tons; 1917, 3,799,000 tons; 1918, 3,820,000 tons. The corresponding quantities of anthracite retained for home consumption were: In 1913, 2,219,000 tons; 1914, 2,330,000 tons; 1915, 2,485,000 tons; 1916, 2,644,000 tons; 1917, 2,415,000 tons; 1918, 2,658,000 tons. Up until 1917 the home consumption of anthracite increased, and though there was a falling off in that year the consumption was still higher than in 1913. In 1918 the consumption again showed an increase and was greater than in any of the five preceding years.

Destination of Exports

Exports of coal according to destination are summarized below. (A statement given later in this article presents the figures in greater detail.) These figures do not include either coke or patent fuel exported, items that in certain cases (for example, that of France) represents a notable addition.

Exported to	1913 Tons	1914 Tons	1915 Tons	1916 Tons	1917 Tons	1918 Tons
European allies	33,995,000	28,014,000	25,863,000	25,133,000	24,931,000	22,065,000
Enemy countries	10,436,000	6,330,000	10,000	6,000	40,000	19,000
Neutrals	23,488,000	20,297,000	15,221,000	11,404,000	4,555,000	4,712,000
British possessions	5,481,000	4,399,000	2,441,000	1,809,000	5,470,000	4,957,000
Total	73,400,000	59,040,000	43,535,000	38,352,000	34,996,000	31,753,000
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
European allies	46.3	47.4	59.4	65.5	71.2	69.5
Enemy countries	14.2	10.7	.....	.....	0.1	0.1
Neutrals	32.0	34.4	35.0	29.8	13.0	14.8
British possessions	7.5	7.5	5.6	4.7	15.7	15.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

The markets lost on account of military operations—Russia, Belgium, Roumania and the enemy countries—took, in 1913, about 18,717,000 tons; but in 1918 only 128,000 tons were sent to Russia and a small quantity to redeemed Turkish territory. Exports to Portugal fell to one-eighth and exports to Portuguese African colonies to less than one-sixth of the prewar figures. On account of submarine troubles in the Mediterranean, exports of coal to Italy were in 1915 and 1916 only about 60 per cent., and in 1917 and 1918 only 42 to 43 per cent., of the annual prewar exports. Exports to France, Algeria, French African colonies and Tunis formed only 19.7 per cent. of the total coal exports from the United Kingdom in 1913, but rose to over 55 per cent. in 1917 and 1918.

Exports to France were 37 per cent. higher in 1917 than they were in 1913, and even in 1918 they were 29 per cent. higher. The distribution of coal to Algeria and Tunis was notably affected by convoy arrangements in 1917, and the same cause explains the very large increase to French West Africa in that and the following year. The exports to France and French African possessions rose from 14,473,000 tons in 1913 to 19,269,000 tons in 1917, or a 33 per cent. increase; but quite apart from the temporary loss of French mines, the special distribution resulting from war causes will plainly not be reproduced under peace conditions. The case is different with Italy, where normal supplies were reduced through the state of war, though the need for coal had increased. France, Italy and their African possessions took 24,125,000 tons, or 32.9 per cent. of the total British exports of coal in 1913; in 1917 they took 23,410,000 tons, or 66.9 per cent.

Neutral Markets—British Possessions

Trade in 1918 with the countries which were neutral in 1915 was only about one-fifth of what it was in 1913; however, this marked some recovery from 1917, when it was a little less than one-fifth. The trade with all these countries fell off progressively during the war, as military and naval demands increased and shipping difficulties became greater. Exports to Scandinavia were in 1918 only 33 per cent. of the 1913 quantity; to Netherlands and Java, a little over 4 per cent.; to Spain and the Canary Islands, under 12 per cent.; to South America, under 9 per cent.

Exports to British possessions (including Egypt) formed 7.5 per cent. of the total exports of coal from the United Kingdom in 1913; in 1917 they were almost the same in quantity, but 15.7 per cent. of the total. Thy had, however, in 1916 fallen to 1,809,000 tons from the 1913 figure of 5,481,000 tons. The exports to Gibraltar and Malta in 1917 were nearly three times what they had been in 1913 and nearly five times the 1916 figure; exports to Egypt were in 1917 only half their 1913 total, but nearly double that of 1916. Exports to these Mediterranean destinations formed very nearly 83 per cent. of the total exports to British possessions in 1917, and were plainly determined by naval policy. Exports to Canada, West Indies and Falkland Isles also showed increases over 1913, for the same reason. On the other hand, exports to Aden fell from 181,000 tons in 1913 to 23,000 tons in 1917; to India, from 179,000 tons to 7000 tons; and to Ceylon, from 240,000 tons to 13,000 tons. In 1918 exports to India were 1350 tons; to Aden and Ceylon, nil.

This brief review of Great Britain's coal export trade may be summed up by saying that from the outbreak of the war exports were sacrificed to military and naval necessities and to the need of rendering assistance to France and Italy, and this sacrifice was coincident with a loss of nearly three-fifths of the bunkering trade (part of which, however, was made good by an increase in Admiralty requirements), and with a continuous and heavy draft on the quantity "available for home consumption" by the naval and munition authorities.

The prospects of an early recovery of the export trade in coal are affected by many considerations. Until the production of coal approaches the prewar level there will be a competition between home industry and

foreign countries for certain classes of steam coal. The demands of countries subjected to the ravages of war will depend on the rate at which their industries can be restored and their own mines can be put in full effective operation. Political considerations may also affect trade for some years to come. Neutral countries will be able to resume their demands for certain classes of coal, but their requirements in others will depend on the condition of world commerce. Certain expanded exports from the United Kingdom will certainly return to their prewar level, since the expansion depended on naval policy.

A further factor has still to be considered—the entry of the United States into markets from which it was previously practically excluded on account of the greater cost of the American coal. Despite the cessation of war conditions, that footing may still be maintained on account of the increased cost of production of coal in the United Kingdom and the greater expense of operating British ships. The most striking advances in the American coal export trade (other than that to Canada) were in European and South American markets.

The effects of the entry of the United States into the war and of the preoccupation of ships for purposes other than the coal trade are strikingly shown by the heavy decrease of United States exports to Europe in 1916-17, a decline which was accentuated in the following 12 months. Exports to Italy formed 79.2 per cent. of the trade in the two prewar years and 75.8 per cent. in the three following years taken together, although the average annual exports of the latter period were three and a half times those of the former. Comparing 1916-17 with 1912-13 and 1913-14, there does not appear to have been a very abnormal increase in the exports to Italy, and in 1917-18 they fell to 201,000 tons; but this, in turn, may have been due to war conditions.

The increase in exports to South America is more serious. The diversion of British tonnage to other routes and special needs for coal gave the United States coal exporters their opportunity, and in 1916-17 their shipments to South America were four and a half times what they were in 1912-13, while those from the United Kingdom in 1917 were only one-ninth of what they had been in 1913. On the other hand, in 1917-18, when the United States also felt the demand for shipping, exports from that country to Argentina fell to 248,000 tons and those to Brazil to 625,000 tons, while those to Uruguay rose to 109,000 tons. For those three countries together there was thus a fall of 37.4 per cent. compared with the previous year. The return of the diverted British ships to the South American trade will help to restore the balance, but it is plain that strong competition will have to be faced.

Exported to	1913 Tons	1914 Tons	1915 Tons	1916 Tons	1917 Tons	1918 Tons
European allies:						
Russia	5,998,000	3,088,000	43,000	5,000	1,075,000	128,000
France, Algeria and Tunis	14,250,000	13,394,000	18,628,000	18,096,000	18,715,000	17,166,000
French African colonies	223,000	148,000	165,000	219,000	554,000	507,000
Belgium	2,031,000	1,169,000	.....	.....	.....	4,000
Portugal	1,202,000	1,049,000	917,000	794,000	248,000	147,000
Portuguese African colonies	387,000	306,000	316,000	309,000	198,000	59,000
Italy	9,647,000	8,625,000	5,789,000	5,710,000	4,141,000	4,054,000
Italian African colonies	5,000	17,000	5,000	.....	.....	.....
Roumania	252,000	218,000	.....	.....	.....	.....
Total	33,995,000	28,014,000	25,863,000	25,133,000	24,931,000	22,065,000
Enemy countries:						
Germany	8,952,000	5,257,000	.....	.....	.....	.....
Aystria-Hungary	1,057,000	564,000	.....	.....	.....	.....
Bulgaria	57,000	80,000	.....	.....	.....	.....
Turkey*	370,000	429,000	10,000	6,000	40,000	19,000
Total	10,436,000	6,330,000	10,000	6,000	40,000	19,000
Neutral countries:						
Sweden	4,563,000	4,250,000	2,660,000	1,646,000	614,000	1,051,000
Norway	2,298,000	2,462,000	2,643,000	2,308,000	1,059,000	1,251,000
Denmark and Iceland	3,139,000	3,165,000	3,209,000	2,367,000	878,000	1,086,000
Netherlands and Java	2,053,000	1,750,000	1,804,000	1,346,000	377,000	88,000
Spain and Canaries	3,649,000	2,940,000	2,068,000	2,408,000	812,000	429,000
Greece	728,000	579,000	309,000	168,000	18,000	41,000
China	26,000	10,000	.....	.....	.....	.....
Mexico	20,000	2,000	.....	.....	.....	.....
South America	6,910,000	5,004,000	2,499,000	1,131,000	762,000	60,000
Other foreign countries	102,000	135,000	29,000	30,000	35,000	10,000
Total	23,488,000	20,297,000	15,221,000	11,404,000	4,555,000	4,712,000
Total foreign countries	67,919,000	54,641,000	41,094,000	36,543,000	29,526,000	26,796,000
British dominions:						
Europe	1,223,000	810,000	638,000	718,000	3,055,000	2,905,000
Africa†	3,367,000	2,796,000	1,476,000	938,000	2,001,000	1,916,000
Asia	682,000	585,000	203,000	68,000	105,000	1,000
Australasia	.....	5,000	.....	.....	.....	.....
North America	119,000	128,000	35,000	16,000	177,000	70,000
South America	43,000	44,000	75,000	61,000	59,000	43,000
Other British possessions	47,000	31,000	14,000	8,000	73,000	22,000
Total	5,481,000	4,399,000	2,441,000	1,809,000	5,470,000	4,957,000
Grand total	73,400,000	59,040,000	43,535,000	38,352,000	34,996,000	31,753,000

* Including territories formerly Turkish, but now in the occupation of the allies of the United Kingdom.
† Including Egypt in all the years specified.

Production in South Africa and India—Germany's Trade

The output of coal in South Africa in 1913 was 7,858,000 tons; it rose to 9,775,000 tons in 1917 to meet the special demands for coaling ships at Durban and Delagoa Bay. That particular requirement for ships diverted to the Cape route has now ceased, and the South African coal will have to face the competition of the dearer but better British coal. It is worth noting that, notwithstanding this increase in output, British exports to the Cape rose from 65,000 tons in 1913 to 162,000 tons in 1917, the increase being, of course, due to naval policy; on the other hand, the trade to Mauritius, which had been 40,000 tons in 1913, fell to 1302 tons in 1917, and this trade might well be captured by the South African coal mines.

Exports of coal from British India rose from 722,000 tons in 1913-14 to 829,000 tons in 1916-17. Competition between British and Indian coal seems to threaten only in the Ceylon market. The extent to which India appears to have become self-sufficient during the last five years may also be gaged by the fact that the exports of coal from Japan to British India fell from 180,000 tons in 1913 to 29,000 tons in the first 11 months of 1918.

Chief Foreign Purchasers of British Coal

How far the import coal trade of France and Belgium may be affected by imposing on Germany an obligation to supply coal for a period until the French and Belgian mines are restored it is at present impossible to say, and what may be the effects of any such decision or of any transfer of coal fields on the ability of Germany to supply coal to the Netherlands and elsewhere is equally obscure. The disappearance of the great Russian market, even temporarily, is another enormous factor, but there appears to be no reason to suppose that in the markets where German and British coal formerly met in competition the competitive power of British coal masters will be relatively impaired in the future. The chief foreign purchasers of British coal during the past six years are tabulated at the top of this page.

Finally, the recuperative power of the German coal trade must be taken into account. In 1913 the chief exports from Germany were as follows, those from the United Kingdom being given for comparison:

Exported to	From Germany, Tons	From United Kingdom, Tons
Austria-Hungary	12,153,000	1,057,000
Netherlands	7,218,000	2,018,000
Belgium	5,728,000	2,031,000
France	3,242,000	12,776,000
Russia	2,103,000	5,998,000
Switzerland	1,639,000	.....
Italy	892,000	9,647,000
Spain	279,000	2,534,000
Denmark and Iceland	220,000	3,139,000
Sweden	178,000	4,563,000
Roumania	131,000	252,000
Other countries	791,000	29,385,000
Total	34,574,000	73,400,000

Hampton Roads Coal Exports

NORFOLK

			Cargo	Bunkers
Lamberts Point				
Apr. 29	Amer. S.S. Barabos	Mollendo, Peru	2,348	940
Apr. 30	Amer. S.S. Felix Taussig	Rio de Janeiro, Brazil	7,760	1,540
May 2	Amer. S.S. Saxon	Rio de Janeiro, Brazil	2112	913
May 3	Am. Sch. Hauppauge	Rio de Janeiro, Brazil	1,931	....
Sewalls Point				
Apr. 28	Dan. S.S. Hugo	Santiago, Cuba	1,878	102
Apr. 29	Amer. S.S. Calaveras	Havana, Cuba	3,299	408
May 1	Amer. S.S. Lake Stirling	Havana, Cuba	2,406	384
May 3	Amer. S.S. Anna	Santiago, Cuba	1,132	301
Newport News				
Apr. 28	Swed. S.S. Hermes	Havana, Cuba	2,150	186
Apr. 29	Dan. S.S. Henry Tegner	Nuevitas, Cuba	2,079	165
Apr. 29	Br. S.S. Pakeha	Wellington, N. Z.	4,809	1,798
May 2	Swed. S.S. Harald	Havana, Cuba	2,268	147

HAMPTON ROADS COAL DUMPINGS

April, 1919

	Gross Tons
Norfolk & Western R.R.	485,340
Virginian R.R.	202,983
Chesapeake & Ohio R.R.	235,873
Total	924,196

Promises Early Relief in Tonnage Situation

Export circles were much interested in the recent statement by H. C. Hoover, Food Administrator, that after July 1 many of the ships now carrying foodstuffs to Europe could be released for export trade. In response to inquiries from its members, the American Manufacturers' Export Association took this matter up with John H. Rosseter, Director of Operations of the United States Shipping Board. Mr. Rosseter, who, it will be recalled, issued a statement several weeks ago promising adequate American shipping facilities within thirty days, again asserts that a more liberal assignment of vessels to commercial trades has not only been accomplished, but that this movement will continue with in-

creasing importance during the present month.

Mr. Rosseter's statement given to the Export Association follows:

"Due to the urgency of earliest possible shipment, it has been necessary for some months past to assign every available ship to the service of the Food Administration. As indicated some weeks since, we confidently expect to pass the peak of this requirement within the next few days. We have now practically reached that point, and during the past week have happily been able to begin a more liberal assignment of vessels to commercial trades. This movement to the support of commercial lines will continue with increasing importance during May, and it is expected that with the return of ships from Europe and new tonnage coming from builders we will be in a position during June to take good care of the commercial berths so long neglected.

"In the same way we hope to be able to provide tonnage for the movement of coal, for which there is a large and insistent foreign demand. As also to provide more tonnage for cotton, which movement has been badly congested and very poorly served during the past sixty days."

American Coal Exports in March

Exports of coal, as reported by the Department of Commerce, for March, 1919, and the figures for March, 1918, as finally revised, are as follows:

(In Tons)

	Mar., 1918	Mar., 1919
Anthracite	397,358	117,805
Bituminous	1,223,137	554,037
Exported to:		
Italy	2,473	17,197
Canada	849,282	352,883
Panama	21,959	5,290
Mexico	13,971	5,429
Cuba	170,087	38,107
Other West Indies	45,213	21,548
Argentina	25,623	8,670
Brazil	27,323	60,296
Chile	None	6,934
Uruguay	5,999	3,660
Other countries	61,207	34,023
Coke	141,213	33,749

Practically the only coal imported originates in Canada. In March, 1918, 118,003 tons were imported. In March of this year, the imports were 68,965 tons.

Important Modifications of Bunker Regulations

As a further modification of the bunker rules and regulations, the War Trade Board announced on May 2 that the issuance of trip bunker licenses to vessels of all flags has been discontinued and that time bunker licenses are now being issued to all vessels regardless of flag, valid until revoked, authorizing such vessels to secure in the United States or its possessions bunker fuel, port, sea and ship's stores in appropriate quantities, whenever said vessels are engaged or about to engage in trade to any part of the world, except Germany and Soviet Russia, unless a permit to trade with said countries is issued by the War Trade Board or by the Inter-Allied Trade Committees at Copenhagen, The Hague, Christiania, or Stockholm, or by the Allied Blockade Committee at London.

The War Trade Board also announced that the execution of Bunker Form B-4, which is an agreement required by Sec. 5 of General Rules No. 1, and Bunker Forms B 5-a and/or B 5-c, which are agreements that vessels will return to the United States, have been discontinued. Furthermore, owners and time charterers of vessels are notified that all outstanding commitments and guarantees previously made by virtue of the execution of said agreements are hereby canceled and released, and all owners and charterers are hereby relieved of any and all their obligations thereunder.

Switzerland during the third quarter of 1918 imported altogether 322,643 metric tons of coal (as against 311,570 tons in the corresponding quarter of 1917), 17,347 tons of lignite (301 tons in 1917), 211,671 tons of coke (191,842 tons in 1917), and 83,217 tons of briquets (as against 116,124 tons in 1917. The bulk of the coal (251,640 tons in 1918), lignite (17,316 tons), coke (196,392 obtained from Germany, and only comparatively small quantities of coal from France (23,915 tons) and Belgium (43,656 tons), and of briquets (83,200 tons) was tons in 1918).

Plans to Export Large Volume of American Coal

Means whereby a large volume of American coal can be exported will be found within the next few weeks, it is believed in Washington. An interdepartmental committee, brought into being by the foreign trade adviser of the State Department, soon will recommend a plan to be followed in this connection. The plan itself already has been drafted and revised carefully by a subcommittee of twenty, which includes the Government's principal coal specialists.

The plan now is ready to be placed before the main committee. It is believed, in view of the painstaking care of the subcommittee, that the plan will be approved in practically the form recommended. The subcommittee declines to discuss or give out any information regarding its recommendations, but it is understood that some opposition from the coal operators is anticipated to a portion of the plan.

The coal industry has not been consulted at this writing, but it is expected that representatives of the industry will be called in before the plan is put in final form.

The Government is in a position to exercise an important control over coal exports through its control of shipping. The operators are without official information as to the work of the interdepartmental committee, but their representatives in Washington are a unit in declaring that they are willing to coöperate in any way that will allow exporting to begin. Their aim is to eliminate the present stagnation in the industry by exporting the largest possible volume of coal. There is no tendency to quibble over details. All they want is ships. Once the tonnage is assured, there will be no delay in forming the export association, it is declared.

Foreign Freight Rates

W. W. Battle & Co.'s coal trade freight report under date of May 12, states that the Shipping Board at the present time allows American shippers to charter foreign steamers to carry coal from United States ports to ports on the East Coast of South America on rates, and that this decision may enable American shippers to regain some of the Argentine coal business, which they recently lost.

There are a number of sailing vessels offered for coals to East Coast South American ports at the Chartering Committee's maximum rates, and also a few sailers asking for transatlantic coal. An outside steamer, about 7000 tons coal capacity, was recently offered at $27.50 net form, for coals to Genoa, June loading. Freight market conditions are practicaly the same as a week ago.

The Chartering Committee's rates are as follows:

Steam—Havana, $7.50, 600 tons dis.; Cardenas or Sagua, $9, 300 tons dis.; Cienfuegos, $9, 500 tons dis.; Caibarien, $9.50, 300 tons dis.; Guantanamo, $8.50, 500 tons dis.; $9, 400 tons dis.; Manzanillo, $9.50, 300 tons dis.; Bermuda, $9.50, and Bermuda, p. c. and dis. free, 300 tons dis.; Kingston, $9.50, 400 tons dis.; St. Thomas, $10, 500 tons dis.; St. Lucia, $11, 500 tons dis.; Santiago, $8.50, 500 tons dis.; $9, 400 tons dis.; Barbados, $11, 500 tons dis.; Port of Spain, Trinidad, $11, 500 tons dis.; Curacao, $10.50, free p. c. Curacao, 500 tons discharge. Rio, $19.50 net, 1000 tons dis.; Santos, $19.50 net, 1000 tons dis., or $21 net, 600 tons dis.; Buenos Aires, $18.50 net, 1000 tons dis.; Montevideo, $19.50 net, 750 tons dis.; Pernambuco, $18.50 net, 500 tons dis. Bahia, $18.50 net. To Nitrate Range, $16.50 gross prepaid.

Coal Prices in Germany

The enormous increase in the price of coal in Germany is causing anxiety in industrial circles says Algemeen Handelsblad, of Amsterdam, Netherlands, under date of Mar. 30, 1919. The disorders in the coal industry, the increase in the cost of production due to lack of rolling material, the continued strikes and enormous wage increases granted to the miners along with shorter working hours, have made necessary another large increase of the coal prices, averaging 20 to 30 marks per metric ton. [The par value of the mark is $0.238. At the end of March, 1919, the mark was quoted in neutral markets at about 9 cents.] A comparison with the former prices will show the meaning of these figures. Lump coal, for example, cost 13.50 marks per metric ton before the war. At the beginning of September, 1918, or shortly before the revolution, the price stood at 29.40 marks, or more than double the prewar price. At the beginning of January, 1919, the price was raised to 44 marks. The present quotation is 64 marks, or nearly five times the prewar price. Coke was quoted at 17 marks in July, 1914; at 30 marks in September, 1918; at 58.85 marks in January, 1919; and is now quoted at 88.85 marks. The price of coal briquets has increased from 13.75 to 66.10 marks. If we may believe the mine owners, even these enormous price increases are hardly sufficient to cover the increase in the cost of production.

This assertion may well be true, for the State might have exercised its power of veto and refused its consent to such enormous price increases. The increase in the price of coal will naturally increase the cost of production in all other industries. Price increases have already been announced in the iron industry. The steel syndicate has not taken any steps in this direction as yet but will be compelled to follow, as both of its principal materials—coal and iron—have risen in price. An increase of steel prices will force the machinery industry and kindred branches to raise the prices of their products. The endless screw will thus be tightened still further.

An effort will doubtless be made in Germany to counteract the influence of these higher prices by increasing wages. As this process continually leads to new demands, the ability of the German exporting industries to resume competition in the markets of the world will grow less and less, notwithstanding the advantage which the exporters derive from the depreciation of the mark.

Mining Congress and Export Problems

A meeting of the committee appointed by the Committee on Export of the American Mining Congress met May 9, at 10.30 a. m. in New York City. The session was extended till 1.30 p. m., during which time Allen Walker, of the Guaranty Trust Co., submitted three or four plans that had been adopted by various industries. One of these plans seemed to the committee to be well suited to the needs of the coal industry.

Thomas F. Farrell, who has just been elected chairman of the Foreign Trade Committee of the National Coal Association, commonly known as the Committee of 27, while interested in the plan presented, was not disposed to take any action till his committee had met and declared its point of view in the matter of coöperation with the other members of the American Mining Congress' committee. However, Mr. Farrell made the statement, in the course of the meeting, that he believed a solution of the matter might be found along the lines of the plan submitted by Mr. Walker.

The National Coal Association was represented by Charles S. Allen, who filled the place of G. M. Dexter, then out of town. Mr. Allen expressed himself quite favorable to the plan. Another meeting of the committee will probably be called toward the close of this week, the Committee of 27, which was scheduled to meet May 13, having meantime, doubtless, expressed its attitude in the matter. For the prior action of the American Mining Congress, see page 867 of the issue of May 8.

Brazil's December and January Coal Imports

Vice Consul A. I. Hasskarl, of Rio de Janeiro, reports that coal imports into Brazil in December, 1918, amounted to 48,315 metric tons (1 metric ton=2204.6 lb.) compared with 51,676 tons in December, 1917, and 38,930 tons in the corresponding month in 1916. Of these shipments, the United States supplied 32,365 tons in 1918, 51,676 tons (the total imports) in 1917, and 37,964 tons in 1916; the remainder was British coal. During January of the present year, 52,357 tons were shipped into Brazil, of which 49,323 tons came from the United States and 3034 tons from the United Kingdom. In the corresponding month in 1918, total imports amounted to 19,552 tons, all from the United States; in 1917, imports totaled 31,102 tons, 29,264 tons coming from the United States and the remainder from the United Kingdom.

COAL AND COKE NEWS

EDITED BY ALEX MOSS

Harrisburg, Penn.

On May 7, a new workmen's compensation bill, which is understood to be agreeable to all forces, was introduced by Senator Smith of Dauphin. The bill was one of four relating to injured employees which were drawn by the Attorney General. They were immediately reported from committee and read for the first time before the session was adjourned.

The compensation measure reduces the period of waiting before compensation begins, from 14 to 10 days. Another provision of the bill provides 60 per cent. of the average salary, fixed at $10 to $20, instead of the present 50 per cent. On the new percentage basis, the minimum compensation would be $6 a week and the maximum $12.

The new measure further provides that the period of free treatment be increased from 14 days to 30. In case of major and minor operations, a sum not to exceed $100 is allowed and an additional amount for hospital treatment.

Another of the bills introduced by Senator Smith provides for the creation of a Bureau of Workmen's Compensation within the Department of Labor and Industry, which leaves the bureau under the Labor Department as heretofore. There has been a movement under way for some time to create a separate department of Workmen's Compensation, but it is evident that it is not the administration's desire to do so at this time.

Another bill provides for the appointment of a Director of Rehabilitation, who shall care for maimed employees in such a way as to make them fit for other work.

The fourth of the bills would license corporations carrying their own compensation insurance. Companies carrying their own insurance would have to pay a sum equivalent to 2 per cent. of the premium paid insurance companies.

Charleston, W. Va.

All signs point to a general recovery from the slump which began the first of January in the central southern coal fields of West Virginia. Production is gradually growing larger, as demand became more pronounced during the closing days of April. The last-named month was somewhat better from the standpoint of production than was true of March. May 1 brought many additional inquiries for coal, indicating a somewhat more buoyant market. As a consequence mine owners not only felt much encouraged over the outlook, but were able in a number of instances to resume operations, thus cutting down the number of idle mines. Indeed, some fields were able to produce up to 65 and 70 per cent. of their normal output.

For several months mine owners have been encouraged with orders that enabled them to run their mines for as much as two days a week. Orders are now sufficient to keep many mines going four days a week. With increased activity in and around West Virginia mines, a labor shortage is beginning to be felt. During the period of idleness covering four months, there has been an exodus of miners from the state, and the general scarcity of labor may prevent as large a production as might be expected even when conditions reach normal again. The car question has not begun to bother operators so far to any appreciable extent, although it is learned that coal is blocked somewhat at certain forwarding junctions, especially insofar as the lake movement is concerned.

The last days of April and the first week of May saw a growth of encouraging proportions in the shipments of coal to the lakes, although the movement to the lake regions was far from being up to that usually observed this late in the year. Still, from some sections, there was five or six times as much coal being shipped to the lakes as was observed at the outset of April, but some districts were faring better in that respect than others. Heavier shipments to tidewater indicated during the first five days of April a larger volume of export business, but West Virginia operators are not optimistic as to the growth of the export trade to large proportions as long as no effort is made to supply sufficient ships. Still there was undoubtedly more export business in April than during March.

The drive made to force down the price paid for railroad fuel was still contributing somewhat to the uncertainty which has done so much to retard a quicker return to normal conditions, and the volume of railroad fuel shipments around the first of May seemed to be somewhat lighter than was true during the last half of April.

Fairmont, W. Va.

Shipments from the Fairmont field, and in fact from all parts of northern West Virginia, during the first six days of May, indicated a healthy revival in the demand for coal from the northern part of the state, both in eastern and western consuming areas, the only fly in the ointment being the low price at which some operators were selling their coal to railroads in the east. Shipments had jumped to 824 cars a day by May 2, the heaviest loading since early in January, on the Monongah division of the Baltimore & Ohio. On the same date more coal was being mined and shipped to Curtis Bay than at any time during the year, some of it for export markets. Even lake shipments continued to grow in volume. There was also apparent an increase in orders for railroad fuel, shipments on May 2 being larger than at any time since the latter part of March. Total shipments for April reached 14,101 cars, or 1586 more cars of coal than were loaded and shipped in March. As the month of May progressed, a steady decrease in the number of idle miners was discernible. Complaint is being made against the Baltimore & Ohio for withholding information as to how much coal it is buying.

George T. Watson, assistant to the president of the Consolidation Coal Co., commenting on present and future conditions in the industry, predicts that there will be an acute car shortage within the next few months unless steps are taken by the railroads to renew their equipment or unless new equipment is added. He is of the opinion that the next few months will witness unexampled activity in the coal trade.

George T. Bell, executive vice president of the northern West Virginia Operators' Association, has advised members of the association that he has learned that the present practice of railroad fuel agents asking bidders on railroad fuel to revise their bids or to submit new bids after the bids are supposed to have been closed, is admittedly followed for the express purpose of obtaining lower bids.

Du Quoin, Ill.

Current reports state that the Chicago, Burlington & Quincy R.R. is planning to increase its equipment and storage yards in Williamson and Franklin Counties in order to make more room for handling coal from Herrin, West Frankfort and Christopher. It has purchased 2500 acres of land near Cambon and intends to sink a large mine at that place and also erect a roundhouse with better water facilities to supply the locomotives in that district.

A new coöperative store has been opened in this city by the local unions of the miners employed at the Security, Paradise and Majestic mines, with J. W. Gibson as store manager. The coöperative store idea has become popular among the miners of southern Illinois, and a number of these stores have been started in an attempt to reduce the high cost of living.

Announcement has been made by State Mine Inspector Frank Rossbottom that the conference between miners' representatives, operators and school authorities, which was to be held in this city Friday, May 9, for the purpose of discussing "vocational education" for the miners, has been postponed until June 6.

PENNSYLVANIA

Anthracite

Jermyn—The large breaker of the Delaware & Hudson colliery here was closed on May 2 for an indefinite period. It was stated that mining operations will continue at the colliery and that coal will be sent to the Powderly breaker at South Carbondale. It is believed that the Jermyn breaker will be abandoned.

Lykens—Announcement was made on May 7 that the Susquehanna Collieries Co.'s offer to sell its Lykens Valley holdings rather than submit to an increased assessment had been withdrawn with the expiration of the month of April. Officials said that they would still consider an offer to sell if a purchaser turns up.

Honesdale—The Howard Coal Co. has sold its holdings in the large culm dump along the old Gravity roadbed to P. J. McDonald, of Scranton, who has been working it on the royalty basis for some time. It is estimated that there are over 100,000 tons of coal in the pile. The consideration is said to have been $50,000.

Carbondale—It is reported that the Tip Top Coal Co. has voluntarily ceased mining operations on the mine fire tract in this city, and that the breaker and other equipment is now being removed from the property. The lessee of the tract, George W. Tappan, concluded to cease operations, it is said, after the city filed the petition asking for an injunction to restrain him from further mining on the tract.

Minersville—The Pine Hill Coal Co. has started to clean out Wolf Creek in accordance with its agreement with the borough officials, and other coal companies of the region will coöperate at once. These corporations have agreed to clean out the streams, as the culm has swept over Minersville, seriously blocking sewers and drains and even backing water from the sewers back into the houses, creating a most unsanitary condition.

Hazleton—Mine Foreman Adam Lesser and his assistant, John Hurley, of the Upper Lehigh colliery, claim that they have smashed to smithereens the record of Harry Lewis, of the Primrose mines of the Lehigh Valley Coal Co., whose feat in running a slope for five years without a single fatality has been given wide publicity. In the 25 years that both men have been in charge at Upper Lehigh, that colliery has had just two fatal accidents. In that time the mines produced 2,880,000 tons of coal, or 1,440,000 tons per fatality.

Hazleton—The Hazleton and Mahanoy Division of the Lehigh Valley R.R. reports that coal tonnage traffic during April had climbed to between 65 and 70 per cent. of the volume handled during the war and severe winter rush of last year. This is about the maximum, inasmuch as the stripping and culm bank sources of supply that ran totals so high last year are now almost depleted. The railroaders are getting steady employment and the outlook for work all summer, both on the coal division and in the mines, is excellent.

Pittston—An unusual case, growing out of the sale of four acres of coal land in 1882, on which suit was started in 1911, has just been decided by Judge Fuller (Luzerne) in the suit of the executors of Theodore Strong, late of Pittston, against Abram Nesbitt, of Kingston, in which the court sustains the exceptions to the report of the referee and enters judgment for the defendant. Apart from the fact that it is over 37 years since the coal was sold and eight years since the suit was started, the proceedings reveal the value of the coal from the fact that although only $2411 was paid originally the plaintiff received $9601 in royalties. The case was highly complicated. It seems that the four acres of coal land sold under a certified road, the title of which Mr. Nesbitt had obtained through a patent from the Commonwealth, and he had what was con-

sidered a good title until the decision of the Supreme Court in 1898, when it was decided that certified roads were not exempt from the general rule that abutting property owners owned to the center of the highway. At this time Mr. Strong had leased the coal to the Delaware, Lackawanna & Western Railroad Co., but by the decision of the company itself became the owner of the coal because it owned the abutting property. Then the executors of the Strong estate brought suit to recover the money originally paid and were awarded the full amount by the referee, with interest amounting to $7612.

Pottsville—This is the richest coal city, not only in the United States, but in the whole world, according to a report made by W. C. Monroe and W. F. Sekol. These engineers stated that there is 80,000,000 tons of coal under Pottsville, in well authenticated veins, the coal being more than 200 ft. in thickness. It is premium quality, much of it being of the famous Lykens Valley red ash. There are 22 veins above the Mammoth and four veins below. More than this, Sekol and Monroe stated that Pottsville is the center of the great anthracite basin and that of the 53 billion tons of coal remaining unmined in this region, 41 billions are in this section.

Freeport—The Beal Coal Co. will build an up-to-date tipple this summer at its new mine now being opened at this place. The tipple will have a capacity of 600 tons a day.

Bituminous

Indiana—The Coal Run Mining Co. has moved its general offices from the Elwood Building, Rochester, N. Y., to the Savings and Trust Building here. Among the officials to be transferred are John O'Connor, treasurer, and L. W. Robinson, Jr., general manager.

Uniontown—There has been no noticeable improvement in work in the Connellsville coke region the past week, though a few small accumulations seem to have been disposed of at a reduced price. In the central and western Pennsylvania bituminous fields there has been considerable improvement, due partly to the Lake trade.

Brownsville—Following the strike at the mines of the Vesta Coal Co., when the men decided to return to work the mines were closed down by the company and are now idle. This company is a subsidiary of the Jones & Laughlins Steel Co.

The H. C. Frick Coke Co. has closed down the ovens at its Buffington and Footedale coke plants. It is rumored that this company will close all its operations for sixty days.

Pittsburgh—On Monday, May 5, at the annual meeting of the stockholders of the United Coal Corporation, the proposition from the J. H. Hillman Sons Co. for the mutual operation of the properties of the former company and other operations, and the change of the name of said company to the Hillman Coal and Coke Co. was acted upon favorably, the change to be effective June 1. J. H. Hillman, Jr., president of the Hecla Coal and Coke Co. and the Thompson-Connellsville Coke Co., was elected chairman of the Board of Directors, and T. W. Guthrie, president of the United Coal Corporation, was elected president. What changes, if any, will be made in the operating personnel has not yet been announced.

Waynesburg—In addition to the sales and transfers of coal land recorded on p. 885 of the May 8 issue of *Coal Age* are the following sales of coal land to the Cumberland Coal Co.: J. R. Nutt, Cleveland, Ohio, eight tracts in Whiteley township, consideration, $292,308.40. T. B. Seamans, Uniontown, one-seventh interest in six tracts in Cumberland and Monongahela townships, 562.46 acres; consideration, $62,-104.12; G. S. Harah, Uniontown, one-seventh interest in nine tracts in Cumberland and Jefferson townships, 595,716 acres; consideration, $42,456. Chalissa Roberts, one-eighth interest in a tract in Cumberland township, 24 acres; consideration, $1. Carl C. Minor, one-eighth interest in tract in Cumberland township, 59 acres; consideration, $1. Arley W. Kisinger, one-eighth interest in tract in Cumberland township, 158 acres; consideration, $13,833.21. Thomas W. Wright, one-eighth interest in a tract in Cumberland township, 9.19 acres; consideration, $1. Other transfers to the Cumberland Coal Co. include Charles H. Jordan, coal underlying a lot in Jefferson borough; consideration, $250; Susan V. Young, one-half interest in 181 acres, Greene township; consideration, $64,751.75. Irving H. Cottom, of Fayette County, has sold an undivided 25-1767th interest in 16 tracts in Richhill township to Harry A. Cottom, of Brownsville; consideration, $3000.

WEST VIRGINIA

Huntington—A loss of $50,000 was sustained by the Island Creek Coal Co. at its No. 2 plant at Holden recently, when the tipple at that mine was destroyed by fire. It is the intention of the company to rebuild the tipple without any delay. A. R. Beisel is the president of the Island Creek Company.

Whipple—The New River Coal Co. is understood to be arranging plans for the erection of new coal tipples at its properties at Whipple, Lochgelly and Summerlee. At the present time the company has a daily production of about 12,000 tons.

Bluefield—The Coalwood plant of the Carter Coal Co. is to be the scene of numerous improvements during the summer months, plans being now under consideration for the erection of a steel tipple and automatic hoist as well as for the construction of a number of dwellings for miners. The shaft at which the tipple is to be built constitutes the entrance to about 1900 acres of coal.

Macdonald—Full speed ahead are the orders at all the operations of the New River Co.—15 in all—in Fayette and Raleigh Counties, and as a result the company is getting out about 12,000 tons of coal a day. Orders on hand will make it possible to operate on a full-time basis for the next month, and by that time it is believed further orders will enable the company to keep its mines on a full-time basis indefinitely.

Charleston—A deal of as large a magnitude as has been recorded in this section in some time was that through which the General Underwriters, Inc., acquired the control of the Penn-Virginia Coal and Coke Co.'s holdings of the Black Band Fuel Co. for $100,000. The purchase includes leases for coal, oil and gas to the Paint Creek Collieries Co. and the South Penn Oil Co., 500 shares of Kanawha Central R.R. stock at the par value of $100, together with the mining equipment, etc. It is regarded as certain that under the new ownership there will be extensive development of the Black Band property in the future.

Huntington—Further impetus was given to production in the Logan field at the beginning of May through a continued increase in lake orders, the total increase being 7000 tons, the coal loaded ascending from 131,000 to 138,000 tons, bringing the ratio of production up to nearly 50 per cent., or, to be exact, 46 per cent., as against 38 per cent. for the previous week. There was a most pronounced reduction in the total production loss from 211,000 tons to 162,000 tons, or a difference of 49,000 tons. Still, as might have been expected, the "no market" loss was still running high —144,000 tons. Other sources of production loss did not amount to more than 5 per cent. That production is still far below normal is shown by the fact that at this time last year the output was at the rate of 200,000 tons a week—a difference of 62,000 tons.

Clarksburg—The Corons Coal Co., successor to the Commercial Coal and Coke Co., has purchased from Floraneus Reynolds' estate at Hepzibah a tract of approximately 100 acres adjoining the tracts of the Short Line R.R. The consideration was $20,000. Much of the land is underlaid with a fine grade of Pittsburgh coal. The company already owns considerable mineral rights in the tract in question and has a mine in operation.

INDIANA

Petersburg—Following the orders for a strike at the Muren mines, south of this city, on the Southern R.R., the Muren Coal Co. has ordered its mines closed down for three months. The Muren company has turned its contracts over to the Ayrshire Coal Co. and has closed its general store until the mine reopens for business. The miners employed by the Muren company struck following a disagreement over petty matters.

Indianapolis—An increase of 25c a ton in the price of Pocahontas shoveled lump has been announced by the Indianapolis coal dealers, making the price $8.25. According to the principal dealers, this is the only grade affected and no further changes in coal prices are likely during the remainder of the summer. At the beginning of April some dealers were charging $7.75 for Pocahontas shoveled lump and some $8. Those charging the $7.75 advanced to $8 and the added advance to $8.25 is now uniform with all the larger companies. To offset this, the summer price of coke is $9.75 a ton as compared to $12 a ton during the winter months.

ILLINOIS

Buckner—A disastrous accident in which one man was killed and three were seriously injured, happened at the Old Ben Coal Corporation mine at this place late Saturday night, May 3. John L. Devot was instantly killed and William Grean, Leslie Greyhouse and Edward Clark were the injured. The four men were ascending on the cage when the engineer seemed to lose control of the levers and hoisted the cage up into the sheave wheels. Devot fell back down the shaft, which was over 600 ft. deep, and the other three men escaped death by falling into the coal chute.

Royalton—The north mine of the Franklin Coal and Coke Co. broke its record last week when 3947 tons of coal were hoisted in eight hours. During the day 1470 pit cars were hoisted. Following the day's work the company gave a banquet to all of the employees of the mine.

Harrisburg—The O'Gara mine No. 12, which is one of the chain of mines controlled by the O'Gara Coal Co., of Chicago, has received orders to close down for an indefinite period. No reason is stated for this order.

Westwood—The U. S. Fuel Co. is planning the erection of a new modern steel tipple at its Vermillion mine at this place. It is expected that the structure will be completed before the end of the year.

Benton—The project of creating a network of electric lines in Franklin, Williamson and Saline Counties, comprising the southern Illinois coal belt, is being revived. It was checked by the war. Before the war, W. H. Schott, of New York, was instrumental in having lines built connecting Eldorado, Harrisburg and Carrier Mills. Extensions were projected to Marion, White Ash, Johnston City, West Frankfort and Benton. It is stated that the revived project will include Christopher, Herrin, Buckner, Ziegler, Royalton and Hurst, and back to Marion, completing a loop of all the principal cities in the coal belt. The lines would touch about 60 mines and would provide transportation for the miners and additional outlets for the coal.

New Douglas—The Madison County Mining Co. announces that it has struck a 7½-ft. seam of excellent coal near here. The seam is believed to be the same as that at Sorento, Ill.

Benton—The Franklin County Mine Examiners' Association has been organized for the purpose of systematizing the work of the examiners and of securing reforms in the mining industry tending to make conditions in the collieries safer to all employees.

WASHINGTON

Mendota—The Mendota Coal Co. is understood to have completed arrangements for the electrification of its local coal-mining properties. The proposed installation calls for a 100-kw. engine-driven generator, 440-volts, three-phase, and approximately 100 horsepower in motors for the operation of the hoist, fans, pumping machinery and other apparatus. The company maintains offices at Centralia, with plant at Mendota.

Foreign News

Montreal, Que., Can.—The Century Coal and Coke Co., Ltd., of Montreal; the Quebec Coal and Dock Co., of Quebec; the Toronto Coal and Dock Co., of Sault Ste. Marie; the Colborne Coal and Dock Co., of Port Colborne, and the New Ontario Dock Co., of Sault Ste. Marie, have consolidated under the name of the Century Coal Co., Ltd., of Montreal. The new corporation has an available capital of $2,500,000 and plans extensive alterations and additions to dock and storage facilities.

Personals

Thomas Simpson, of Belleville, Ill., has been elected County Mine Inspector for St. Clair County by the Board of Supervisors.

N. S. White, formerly mine foreman of No. 7 mine of the Anita Coal Mining Co., has been made superintendent of the Horatio mines of that company, at Punxsutawney, Penn.

Capt. J. A. McIntosh, who has been in the service overseas with the tank corps, has returned to his former position in the engineering department of the Ohio Brass Co., Mansfield, Ohio.

T. V. Bush, for many years in charge of the Coal Department of the Chesapeake & Ohio Railway Co., will take charge of traffic matters for the Raleigh Coal and Coke Co., of Cincinnati, Ohio, effective May 15.

C. C. Fenwick, general mine foreman for the Anaconda Copper Mining Co., Coal Department, at Sand Coulee, Mont., has severed his connections with that company to take charge of the Darby Coal Co.'s works at Darby, Mont.

James Biers has resigned as superintendent of the Horatio mines of the Anita Coal Mining Co. at Punxsutawney, Penn., to become representative for the Hulburt Oil and Grease Co. Mr. Biers' headquarters will be at Indiana, Penn.

John Vose, Sr., has resigned as mine superintendent of the Sangamon mine of the Wilcoxson Coal and Coke Co., of Chicago, Ill., after continuous service of 31 years. Mr. Vose is the oldest mine superintendent in point of service in the State of Illinois.

T. J. Dawson, formerly in charge of the Department of Mines of the Superior Pocahontas Coal Co. and the Collins-Mayo Colliery Co., is now general superintendent of the mines of the Raleigh Coal and Coke Co., of Cincinnati, Ohio. Mr. Dawson's headquarters will be at Raleigh, W. Va.

J. C. Hill, formerly of the Car Distribution Department of the Chesapeake & Ohio, at Thurmond, W. Va., and later with the Fuel Administration, at Charleston, W. Va., has recently been placed in charge of shipping at the Raleigh offices of the Raleigh Coal and Coke Co.

W. J. Culleton, superintendent of the Phillips plant of the H. C. Frick Coke Co. at Phillips, Penn., has been promoted to be superintendent of the Ronco and Leckrone plants of the same company with headquarters at Leckrone, Penn. Mr. Culleton has been at the Phillips plant for several years, and is succeeded at this mine by M. A. Burriss, of Footdale, Penn.

J. P. Brennen, president of the Thompson-Connellsville Coke Co., of Uniontown, Penn., has resigned as active head of the corporation. He has been connected with this and other coke companies for the past forty years and has been called "The dean of coke industry in the Connellsville region." Mr. Brennen has not announced his plans for the future, nor has his successor been named.

H. H. Morris, of Huntington, W. Va., has been appointed as a shippers' representative on the Central Territory coal and coke committee of the U. S. Railroad Administration, whose headquarters are in Pittsburgh. This committee fixes the rates on coal and coke from Pennsylvania, Kentucky, Virginia and West Virginia to western points. Mr. Morris heads the West Virginia Standard Coal Co. He is also heavily interested in the Kentucky Elkhorn Byproduct Co. and is a director in the Central Coal Association.

Obituary

Charles Manhart, a widely known mine operator of Galena, Kan., died recently after an activity of twenty years in the Galena mining fields.

T. Ellsworth Davies, prominent as a mining engineer and coal operator, died suddenly at his home on May 7. As a consulting engineer Mr. Davies had been in much demand, besides being the consulting engineer for the county commissioners of several of the anthracite-producing counties.

Coming Meetings

American Wholesale Coal Association will meet on June 3 at Cleveland, Ohio. Secretary, L. Romanski, Chicago, Ill.

Illinois Mining Institute will hold its annual meeting May 22, 23 and 24. Secretary, Martin Bolt, Springfield, Ill.

National Coal Association will meet May 21, 22 and 23, at Congress Hotel, Chicago, Ill. Secretary, J. D. A. Morrow, Washington, D. C.

Illinois and Wisconsin Retail Coal Dealers' Association will meet at Hotel Nelson, Rockford, Ill., June 4 and 5. Secretary, I. L. Runyan, Chicago, Ill.

International Railway Fuel Association will hold its annual meeting May 19-22 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

Retail Coal Dealers' Association of Texas will hold its annual meeting on May 19 and 20 at Fort Worth, Tex. Secretary, C. R. Goldman, Dallas, Tex.

Southwestern Interstate Coal Operators' Association will hold its annual meeting June 10 in the Keith and Perry Building, Kansas City, Mo. Secretary, C. N. Fish, Leavenworth, Kan.

American Society of Civil Engineers will hold its forty-ninth annual convention in St. Paul and Minneapolis, Minn., June 17 to 20. Secretary, C. W. Hunt, 33 West 39th St., New York City.

Mine Inspectors' Institute of the United States of America will hold its annual meeting July 8 to 11 at Indianapolis, Ind. Secretary, J. W. Paul, Pittsburgh, Penn.

Kentucky Mining Institute expects to hold its annual meeting this year on May 30 and 31 at Lexington, Ky. Secretary, C. W. Strickland, Huntington, W. Va.

American Institute of Mining and Metallurgical Engineers will hold its fall meeting Sept. 22 to 26 in Chicago, Ill. Chairman Chicago meeting, Carl Scholz, 547 West Jackson Boulevard, Chicago, Ill.

American Society of Mechanical Engineers will hold its spring meeting at the Hotel Statler, Detroit, Mich., June 16 to 19. Secretary, Calvin W. Rice, 29 West 39th Street, New York City.

American Institute of Electrical Engineers will hold its annual convention at the Lake Placid Club, Adirondacks, N. Y., June 24 to 27. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

Industrial News

Chicago, Ill.—The Fischer & Hayes Rope and Steel Co., manufacturers of wire rope, manila rope and accessories, have moved to 741-745 West Van Buren Street.

Knoxville, Tenn.—The Coalfield Coal Co., Knoxville, plans to start work shortly on rebuilding its burned tipple and coal-handling plant. C. W. Henderson is treasurer of the company.

Nevo, Ky.—The Rose Creek Coal and Coke Co. has recently filed notice with the Secretary of State of an increase in its capitalization from $20,000 to $100,000, to provide for general business expansion.

Lexington, W. Va.—The Perkins Coal Co. has been incorporated with a capital of $25,000 to engage in the development of coal properties in the Lexington district. J. E. Strickler is the principal incorporator.

Chicago, Ill.—L. V. Este, Incorporated, industrial engineers and accountants, for a number of years located in the McCormick Building, have removed their office to the Century Building, 202 South State St.

Providence, Ky.—The Pluto Coal Co. has been incorporated with a capital of $50,000 to engage in the development of coal properties in the Providence section. W. Scroggins, Andrew Bogg and S. C. Turner are the incorporators.

Birmingham, Ala.—The Kershaw Mining Co. has been incorporated with a capital of $50,000 to engage in general coal-mining operations in Walker County. C. G. Kershaw is president and T. M. Porterfield is secretary-treasurer.

Chicago, Ill.—The American Steam Conveyor Corporation announces the appointment of N. B. Stewart as district representative in charge of the St. Louis territory. Offices have been opened at 708 Merchants-LaClede Building, St. Louis.

Nashville, Tenn.—The Nashville Retail Coal Dealers' Association has been incorporated under the general welfare laws of the State of Tennessee. Fred B. Cassetty, H. H. Perry, J. L. Hales, A. J. Lucas, H. M. Levell and A. D. Andrews are the incorporators.

Athens, Ohio—The Canaan Coal Co. has taken bids for the erection of a new one-story boiler plant at its local works, estimated to cost $10,000. The structure will be about 38 x 39 ft., and will be used for increased capacity. Morris Peterman, Rector Building, Columbia, is architect for the company.

Columbus, Ohio—James G. Young, traffic manager of the Columbus Chamber of Commerce, who was secretary of the Franklin County Coal Committee during the war, has been made a member of the Central Territory traffic committee of the U. S. Railroad Administration, with headquarters at Chicago. He will look after coal interests on the committee.

Altoona, Penn.—Two giant steel coal cars of a new design have been completed at the Pennsylvania's steel car plant. The first of the cars weighs 74,000 lb. and has a capacity of 220,000 lb.—110 tons. The second car is known as Class H26, with a weigh of 82,000 lb. and a capacity of 210,000 lb.—105 tons. Both cars are carried on six-wheeled trucks.

Columbus, Ohio—Announcement was made of the award of Hocking Valley Ry. contracts aggregating about a quarter of a million tons as follows: Essex Coal Co., Columbus, 214,000 tons, at $1.95; Franko Coal Co., Zanesville, 25,000 tons, at $1.95; Cambridge Hocking Coal Co., Columbus, 11,000 tons, at $1.90. In all, there were 21 bids submitted for the business.

Pittsburgh, Penn.—The Pioneer Coal and Coke Co., with headquarters in Pittsburgh, has named Charles F. Colbert, Jr., of Brownsville, Penn., as its general manager. Mr. Colbert for the last eight years had been assistant general manager and sales manager of the Alicia mines of the W. Harry Brown interests. Those mines were recently sold to the Pittsburgh Steel Company.

Columbus, Ohio—Ohio's war record for coal production, recently made public by the department of investigation and statistics of the state industrial commission, shows 48,849,226 tons of coal mined in Ohio in 1918, or 6,000,000 tons more than in any previous year in the history of the state. Belmont County alone produced 12,165,253 tons, or one-fourth of the state's total production.

Okeeffe, W. Va.—The C. L. McPherson Coal Co., recently incorporated under Delaware laws, with a capital of $150,000, is arranging for the development of about 140 acres of coal properties in the vicinity of Okeeffe, to have an initial capacity of about 200 daily, to be increased ultimately to 500 tons. C. L. McPherson, North Fork, W. Va., is president; M. F. Christian is manager.

St. Louis, Mo.—In an opinion recently handed down in the United States Circuit Court of Appeals, a judgment of $600,000 has been set against the United Mine Workers of America to the Coronado County Mining Co., of Sebastian County, Arkansas, for alleged damage caused by members of the union in a strike raid on the property of the company at Jamestown, Ark., and has been conditionally upheld.

New York, N. Y.—The Wilkes-Barre Coal Co., with offices at 123rd St. and East River, makes the interesting announcement that it has taken over a large mine in West Virginia producing one of the best grades of bituminous coal, and that the output is offered to consumers in cargo lots. The company states, also, that it will deliver this coal in any quantity by auto truck to consumers in the metropolitan district. Low prices are quoted for contract or spot delivery. A company expert is available to users who desire specific information regarding burning qualities of the fuel, prices, deliveries, etc.

New York, N. Y.—Work has been started upon a building which it is planned to make the national home for all trade associations now located, or which will locate in the future, in New York City. Among the advantages which are expected from this plan are: Closer coöperation between allied industries; greater convenience for business men desiring to see several associations; special advantages for coöperative meeting rooms, and added prestige due to having a high-grade building devoted to the interests of business men, in the heart of the hotel, railroad and subway terminal districts of New York. The name of the structure will be the National Association Building. It will be ready for occupancy the latter part of next January. Further information may be obtained by addressing Willard C. Brinton, consulting engineer, 17 W. 44th St., New York City.

Chicago, Ill.—Circuit Judge Harris, acting on the petition of the Latham Coal and Mining Co., has ordered suspension of operation of the mine and appointed Harry G. Adams, of Chicago, as receiver. E. C. Lutz, secretary of the company, reported to the court that the company was solvent, with $25,000 more assets than liabilities, but the company has lost $19,000 in the past year, the officers are liable for $13,000 in obligations and there is $19,000 due for materials and supplies. Mr. Adams, who was formerly with the Jones & Adams Coal Co., has taken charge of all property, assets, credits and collect accounts and is notifying creditors to file statements within 30 days. He will dispose of personal property not needed in the conduct of the mine and will raise money to meet the payroll. The company's bills receivable amount to $15,000. The company states that $65,000 is needed to put the business in a safe and competitive condition.

MARKET DEPARTMENT

EDITED BY ALEX MOSS

Weekly Review

Railroads Buying At Satisfactory Prices—Bituminous Industry Awaits General Business Activity—Elimination of Government Control Will Restore Confidence—Anthracite Operators Busy—Domestic Sizes in Excellent Demand

GOVERNMENT attempts at price-stabilization came to an end with the recent resignation of the Industrial Board of the Department of Commerce. The failure of the board to bring the steel producers and the Railroad Administration together had been discounted by the soft-coal industry weeks ago, for it had refused to enter into any negotiations looking to a fixed price for fuel until it received certain assurance that Director General Hines would consider himself bound by any agreement entered into.

It must be stated in all fairness, however, that, contrary to the impression that seems to be prevalent, there is no deadlock in the matter of coal purchases by the railroads. Sales are being made from day to day at prices that seem equally satisfactory to both the railroads and the operators. The price range of coal for railroad use is from $2.55 to roads in New England to less than $2 for roads radiating from Pittsburgh. Between these two extremes is a price of $2.35 for Pittsburgh district coal, while the low figure is for fuel from the Panhandle district of West Virginia.

Judging from the manner in which industry has died off since the signing of the armistice, one would incline to the belief that the major part of American business was the making of war and the manufacture of war materials. The steel industry, for example, a large consumer of coal, at the present time is demanding little fuel, as it is operating only at about 55 per cent. of capacity. Other consuming industries, however, are expanding somewhat, but what the country needs in order to bring about a new era of prosperity is the elimination of all Government control of industry. The return to private ownership of railroads and other public utilities, with the opportunity to operate them at a reasonable profit, will go far toward instilling that confidence without which we must continue to stagnate industrially.

The bituminous coal operators, therefore, are marking time, awaiting in common with others the time when our Government officials arrive at a new understanding. The din and turmoil of battle seem to have so dulled and benumbed the senses of the powers that be that they do not realize conditions have changed. During the war, the Government was the largest customer that industry had, and everything possible was done to bring about a high degree of standardization and centralization. These policies were all right then, but they are all wrong now. The demise of the price-fixing board seems to presage the return of the competitive basis of doing business, and in this direction lies progress—for coal as well as other basic materials.

Shipments of bituminous coal to the lakes have reached important proportions. Operators are rushing coal forward in anticipation of transportation troubles later in the season.

Demand for anthracte is active, and dealers are complaining that coal is not coming fast enough. The stove and egg sizes seem to be the choice of the larger number of consumers, though there is also a good inquiry for broken, chestnut and pea. Due to overproduction, the steam sizes of anthracite are selling at somewhat lower prices than have prevailed for some time, quotations being from 12 to 20 cents per ton lower on the coal produced by the so-called independent companies. The larger operators are storing their surplus of the small sizes. The total quantity of hard coal shipped from the mines in April amounted to 5,224,715 tons, against 3,938,908 tons in March and 3,871,932 tons in February.

WEEKLY COAL PRODUCTION

The production of bituminous coal in the United States during the week ended May 3 is estimated at 8,051,000 net tons and is a considerable improvement over the output of the week preceding. Compared with the same week of last year, however, the current week's production fell 3,324,000 net tons behind. For the calendar year to date, the output of bituminous coal is estimated at 143,773,000 net tons as compared with 189,447,000 net tons during the same period of 1918. The daily average production during the week ended May 3 is estimated at 1,342,000 net tons as compared with 1,356,000 net tons during the period Jan. 1 to date, and 1,787,000 net tons during the corresponding period of last year.

Production of anthracite during the week ended May 3 is placed at 1,695,000 net tons as against 1,401,000 net tons during the week ended Apr. 26 and 1,960,000 net tons during the week of May 2, 1918. For the calendar year to date the production of anthracite is estimated at 25,357,000 net tons and is approximately 25 per cent. below the output during the same period of last year, estimated at 33,134,000 net tons. The daily average per working day during the current week is estimated at 282,000 net tons as against 234,000 during the week preceding, and 239,000 net tons for the calendar year to date.

Shipments of bituminous coal from the tidewater harbors to all points during the week ended May 3 are estimated at 397,684 net tons as compared with 453,074 net tons during the week preceding. Decreases occurred during the week at all harbors with the exception of Baltimore, at which harbor the increase was slight. Loading at Hampton Roads fell behind the most—approximately 37,000 net tons, or 30 per cent.

The tidewater shipments to New England during the week ended May 3 are estimated at 84,066 net tons as against 102,789 net tons for the week ended Apr. 26. The decrease is entirely attributed to the falling off in tonnage loaded at Hampton Roads, the current week's loading amounting to but 28,122 net tons as against 56,455 net tons during the week preceding. During the same week of 1918 total tidewater shipments to New England amounted to 331,470 net tons.

Production of beehive coke in the United States during the week ended May 3 is estimated at 296,163 net tons, and is an increase of approximately 34,000 net tons or 13 per cent. over the production for the week preceding. However, production during the week ended May 3 is but 50 per cent. of the output of the corresponding week of last year. During the current week improvement occurred in production in Pennsylvania, West Virginia, Washington and Utah, while in all other states the output fell even below the output during the week ended Apr. 26. For the calendar year to date the production of beehive coke in the United States is estimated at 7,498,379 net tons as compared with 10,086,351 net tons for the same period in 1918. The daily average for the coal year to date is estimated at 70,738 net tons, while for a similar period last year it was recorded at 95,154 net tons.

Bituminous coal dumped at lower lake ports during the week ended Apr. 26 is estimated at 397,474 net tons and is slightly in excess of the tonnage dumped during the same week of last year, estimated at 370,204 net tons. For the season to date bituminous coal dumpings amount to 958,499 net tons, and is nearly 50 per cent. in excess of the tonnage dumped during the same period in last year.

BUSINESS OPINIONS

Dry Goods Economist—It is evident that business is in a stable condition. From all centers orders for goods are being received and with these orders are many statements showing that consumers are buying liberally and also that they appear well supplied with funds. The course of prices of many commodities is slightly downward, while some other goods have advanced. Where advances occurred they have, as a rule, been due to the payment of higher wages to operatives.

Marshall Field & Co.—Current wholesale distribution of dry goods is slightly less than for the corresponding week a year ago, when there were especially large shipments. More merchants are visiting the market frequently and all report excellent retail business. Orders from road salesmen are in excess of the corresponding week last year for both immediate and future delivery, particularly for fall. Collections are satisfactory.

American Wool and Cotton Reporter—The Boston wool market remains strong and active but buying in the West, or at least the Middle West, has practically ceased for the present on account of the high prices asked by the growers. In the foreign markets the prices are strong. A slightly increased demand from the mills

for cotton continues, but many in the trade do not look for particularly good business until the present feeling of unrest has disappeared. The two prominent factors in the cotton market are peace prospects and the weather.

The Iron Age—Pig iron statistics for April show that that industry is rapidly adjusting itself to the shrinkage in iron consumption. No less than 54 furnaces blew out last month, leaving 212 active as May came in, against 372 on Sept. 1 last year when the peak was reached. In April the output was 2,478,218 gross tons, or 82,607 tons a day, against 3,090,243 tons for the 31 days of March or 99,685 tons a day. Capacity active May 1 was 75,860 tons a day for 212 furnaces, against 93,165 tons a day for the 266 furnaces in blast on April 1. Production at the opening of this month, estimating charcoal iron, was at the rate of 28,000,000 tons a year. This compares with an actual output of 39,052,000 tons in 1918. Not since May, 1915, when there were the first signs of a war demand for American steel, has pig iron production been at so low a rate as today.

Atlantic Seaboard

BOSTON

Market almost featureless. Little inquiry and no change in prices. Bulk of railroad fuel not yet purchased, although one of roads has announced successful bids. Quality grades still firm. Some operators get conservative as to season commitments. Inferior grades slow. Smokeless coals unchanged. Anthracite shipments not sufficient to meet demand on retailers. Slow movement coastwise. Demand continues strong.

Bituminous—The general situation continues without material change. Competitive bidding for railroad fuel tonnage seems to have had very little effect upon current quotations, and the market is as featureless as at any time since January. The differential in favor of all-rail coals is still holding Pocahontas and New River down to a minimum tonnage, confined for the most part to territory immediately accessible to tidewater. There is quiet buying of the better grades from central Pennsylvania, and steam-users long accustomed to the smokeless grades from West Virginia are testing Cambrias and Somersets in the effort to find what they would consider to be satisfactory substitutes. For this reason there is a somewhat better demand for the coals classed as "No. 1," and whatever firmness there is in the present market can be directly attributed to this kind of inquiry.

Stocks are still large and buyers are proceeding very cautiously. It takes constant combing for the different agencies to disclose any contract buying, and spot business is even harder to get than a month ago. So frequently have concessions been made for April and May orders, that buyers expect even lower prices for June and July. It can hardly be said, therefore, that the market in New England is to any extent stabilized.

There is only scattered inquiry and for relatively small tonnages. A large number of manufacturers whose stocks are gradually being depleted are taking advantage of the dull coal market by conducting tests of the different brands of fuel oil now being vigorously pressed on this market. A tonnage which has been estimated as large as 750,000 has been already supplanted by fuel oil. The differential in cost is in favor of the latter, but undoubtedly the largest element in making the change is the continued difficulty large employers have had with labor in their boiler rooms. Oil can be used with a minimum boiler force and for this reason alone is bound to make inroads on coal the next few years. Oil distributors have comprehensive plans for storage at strategic points, and some interesting developments can be looked for. Prices of coal have known no material change the past fortnight. The high volatiles are still in very light request and aside from gas-producing grades there is almost no business for coals of that character. The Fairmont district especially is suffering from the very narrow and restricted market that prevails in this territory

Only one of the New England railroads has announced the successful bids for locomotive fuel for the period ending March 31, 1920. The Boston & Albany awarded 635,000 tons in all to several different shippers, the highest price on Pennsylvania coal being $2.55 per net ton f.o.b. mines. One block of 65,000 tons was bought at $2.15 per net ton, although this was on a coal that takes a 25c. higher rate from the mines. The only price above $2.55 was on Pocahontas, 100,000 tons at $2.75, this to be freighted by water from Norfolk and required for special use on a suburban circuit. While bids have been submitted more than once, no results have yet been announced by either the New Haven or the Boston and Maine, both of which roads have negotiations pending.

The fancy grades on the central Pennsylvania are still being firmly held at previous quotations. Buyers continue to discriminate in favor of these quality grades and it is increasingly difficult to find outlet for even the medium coals from the Clearfield region. Inferior grades continue to be offered in ample volume, but with almost no takers. A certain tonnage is being moved over the New York and Philadelphia piers, buyers being attracted by low figures, but even through this channel the demand is noticeably less than a month ago.

On Hampton Roads coals the situation is practically unchanged. There is a wide variation in price between the offerings of different shippers. Coastwise freights, whether by steamer or barge, are on the basis of $2 to Boston, and as the market stands at present the inquiry for these coals inland is very light and is confined to those consumers who insist upon smokeless and coking coals even though they must pay a high differential for their use. Inland distributors are offering contracts at prices that range from $7.60@$7.90 per gross ton on cars Providence or Boston. So far, however, selling efforts on this basis have had little result.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias and Somersets
F.o.b. mines, net tons	$2.15@$2.75	$2.75@$3.25
F.o.b. Philadelphia, gross tons	4.27@ 4.95	5.95@ 5.50
F.o.b. New York, gross tons	4.62@ 5.29	5.29@ 5.85
F.o.b. Alongside Boston (water coal), gross tons	6.10@ 6.85	6.90@ 7.55

Georges Creek is quoted at $3.20 per net f.o.b. mines.

Pocahontas and New River are being quoted at $4.69@5.14 per gross ton f.o.b. Norfolk and Newport News, Va. Alongside Boston the same grades are being offered at a range of from $6.89@7.24, and on cars Boston and Providence at from $7.60@7.90, per gross ton.

Anthracite—Retailers throughout New England are getting increasingly anxious as the season advances. Much publicity has been given to the difficulty of getting forward coal in sufficient volume, and throughout New England the public is insisting that orders be filled promptly. This is particularly true on egg size, which manifestly will not be needed until next season; but the retail dealers in Boston, for instance, are taking all the orders that come and are trusting to deliveries later on to make good their promises. Many buyers felt at the opening of the season that domestic sizes would come forward much as in a normal year, and that the proportion shipped in April would be relatively large. That was not the case, however, and several large distributors in this market got as little as 5 per cent. of their yearly requirements. Present receipts are by no means sufficient to enable retailers to make anything like the deliveries their trade calls for. Some already have all the business they can comfortably take care of for three to four months ahead. The slow movement of anthracite barges is causing some anxiety, but distinctly there is a better feeling over the outlook now that the Reading fleet is being operated exclusively from Philadelphia. A heavy tonnage comes to this market through that channel, and anything that speeds up the loading of these barges will materially increase receipts at this end.

NEW YORK

Anthracite situation strong, with heavy demand for the domestic sizes. Some so-called Independents quoting coal at slight advances. The anthracite steam sizes quoted at slight decreases, owing to overproduction. Movement in bituminous slow and quotations show much variation. Mines have much idle time.

Anthracite—The situation remains practically unchanged. Demand is active, but the supply of coal is not so large as dealers would like to have it. Production is heavy, but producers and sales agents are endeavoring to distribute the coal impartially, and other parts of the country are just as anxious to secure fuel as is this market, hence the complaints from the local dealers that they are not receiving coal as fast as they would like to get it.

Reports from the coal fields indicate prosperity for the workers. Most of the so-called Independent operations are working full time, their owners in the majority of instances having orders booked ahead for domestic sizes to carry them into July. Practically the same is true of the larger companies, but it was said early this week that all of their operations are not working steadily.

Some wholesale dealers look for a let-up in demand during July and August, with a resumption of activity in early September, which will continue well into the winter.

The lack of supplies is reflected in the cars of anthracite dumped at the local tidewater docks during the seven-day period ended May 9, reports showing 6462 cars dumped as compared with 7022 cars the previous week, a decrease of 560 cars.

Stove and egg are in heaviest demand by the local trade, but there is a good call for broken, chestnut and pea. Orders are plentiful and dealers are heavily booked for future delivery. The product of the so-called Independent operators is being quoted in some cases at slight advances over the regular company schedule.

The anthracite steam sizes are easier than the larger coals, due to their heavy production and the approaching warm months. Quotations are from 12 to 20c. off on Independent product, the larger companies storing their surplus.

The retail situation shows much activity. Much complaint is heard of slow deliveries from the docks, many retail yards having scarcely any of the domestic sizes on hand.

It is said that the formation of another large company to take over several of the present retail yards is about completed, and that it will soon be prepared to begin deliveries.

Several of the City Departments have opened bids for fuel supplies, among them the Board of Education, which requires about 125,000 tons of anthracite and bituminous coal to heat the schoolhouses during the year. Quotations for furnishing and delivering the various sizes to the school buildings range from $10.22 to $12.05 per ton for broken; $10.22 to $12.29 for egg; $10.22 to $12.30 for stove; $8.90 to $10.47 for pea; $7.12 to $8.92 for buckwheat No. 1; $5.89 to $7.94 for buckwheat No. 3, and $7.19 to $9.10 for soft coal, according to Boroughs and places of delivery.

Current quotations, white ash, per gross ton, at the mine and f.o.b. tidewater at the lower ports, are as follows:

	Mine	Company Circular
Broken	$6.05	$7.90
Egg	5.95	7.80
Stove	6.20	8.05
Chestnut	6.30	8.15
Pea	4.90	6.65
Buckwheat	3.40	5.15
Rice	2.75	4.50
Barley	2.25	4.00

Bituminous—The local bituminous market shows little activity. Demand is slow, consumers showing no inclination to stock up. Mining is slow, reports received here being to the effect that many of the openings are idle several days a week, some because of the lack of orders and others because of the attitude of the workers, who, after a couple of days of idleness, refuse to report for work the balance of the week. This may prove to be the salvation of the industry, however, in view of the heavy tonnages thrown back on the market because of the substitution of oil for coal.

It was reported here early this week that one big concern which at one time had an estimated consumption of 500,000 tons of coal annually has now discontinued the use of coal entirely and hereafter would use oil. Similar reports are frequently heard concerning other concerns, but using smaller tonnages of coal.

The danger of a runaway market and higher prices next fall does not cause many of the large consumers to enter the buyer's market for large blocks of coal. They seem willing to take their chances in the open market in securing coal at lower prices and many of them have so far neglected to close contracts for their future supply.

The all-rail trade is in good shape and shows more activity than the tidewater. There is a heavy demand and considerable coal is being put away for future use.

Operators are being approached daily with offers of low prices for coal, but they

are in the main holding strong for prices which will cover the cost of production.

Contract coals are moving steadily, but the spot market is quiet. There is a fair tonnage handled over the local docks, but the dumpings for the week ended May 9 show a decrease from the previous week's dumpings, 5133 cars having been handled as compared with 5955 cars the previous week.

Quotations show a wide variety of prices, much depending upon the urgency of the situation. While the accompanying tabulation shows no change from last week, quotations of various shippers on certain grades for immediate shipment were in some cases slightly lower.

The quotations for the various coals at the mines, net tons, for spot delivery and contract, follow:

	Spot	Contract
South Forks	$2.90 to $3.25	$2.95 to $3.50
Cambria County (good grades)	2.75 to 2.95	2.95 to 3.25
Clearfield County (good grades)	2.50 to 2.75	2.80 to 2.95
Reynoldsville	2.50 to 2.75	2.75 to 2.95
Quemahoming	2.65 to 2.85	2.95 to 3.10
Somerset County (best grades)	2.65 to 2.85	2.95 to 3.10
Somerset County (poorer grades)	2.00 to 2.35	2.50 to 2.75
Western Maryland	2.25 to 2.75	2.50 to 2.75
Fairmont	2.00 to 2.25	2.35 to 2.50
Latrobe	2.10 to 2.25	2.25 to 2.40
Greensburg	2.25 to 2.35	2.35 to 2.60
Westmoreland 2¼ in.	2.60 to 2.75	2.60 to 2.75
Westmoreland run-of-mine	2.35 to 2.60	2.35 to 2.65

PHILADELPHIA

Anthracite demand continues extra strong. Dealers grow impatient at slow deliveries. New business not being sought. Production below normal. Enough stove business for entire summer. Nut not far behind. Pea shows some signs of strength. School coal awarded. Steam sizes in fair call, but smallest sizes go to storage. Bituminous drags along. Good coals in fair demand. Little spot grade. Some improvement in contracting.

Anthracite—There is a growing tenseness of feeling at this time between the retailers and the operators. This is due on the part of the former to their strenuous efforts to obtain shipments to meet the number of orders which have been placed on their books. As a result many of the dealers are becoming unreasonable, as they are insisting upon coal all at the same time. For the moment they have apparently lost sight of the fact that the mines do not produce enough coal in April and May to allow them to fill all their orders and also stock their yards, as some dealers are trying to do. A few years ago we saw coal arrive in the city on the morning of Apr. 1 at that month's price. This was when the stocks in the storage yards were drawn upon during the last few days in March and the coal loaded and started to market on the last day. The retailers are losing sight of the changed conditions and are making miserable the lives of the selling agents.

It is, of course, no use to remind the dealers that the markets of the country lost almost 4,000,000 tons in February and March, after the spring prices were announced, simply because the retailers were afraid to stock coal at that time. Nevertheless this is a fact, and the buyers of coal are feeling the result of it now, for it is tonnage lost that cannot be made up. When the buying actually started a great amount of business was taken from the retail men with the distinct understanding that shipments would be slow, and now some of them are calling daily and demanding immediate consignments.

The result of the rush during the past few weeks has been that the operators are refusing all new business for egg, stove and nut and most salesmen have been instructed by their houses to solicit no new orders for these sizes. For the present at least there appears no hope of increasing the production at the collieries, and due to various celebrations in the region on account of returning soldiers, the tonnage to date this month has been away below normal.

Stove is by all odds in greatest demand, and if all the orders recorded are bona fide the output for all summer has been sold. Chestnut, too, is very active, but a greater amount of it continues to arrive here. Some shippers appear to be longer on egg than others, but as a whole the market is short of it, as the demand is unusual. Pea has strengthened and all the best grades are in fair demand here. There may be concessions in price by some of the smaller operators, but there is no sharp price cutting. As a matter of fact we have heard of some shippers compelling customers to take a certain quantity of pea in order to receive stove and nut. The fact that one of the heaviest buyers of this size and who was the first to announce a substantial reduction in the retail price when the break came earlier in the spring, has recently advanced his rate 75c. a ton, shows the market has improved. Others have advanced from 25c. to 50c. Yet in the face of this improvement one of the largest companies is still unable to move its entire production to market and continues to place some tonnage in the storage yards. Speaking of pea, it is also worth mentioning that the bids for fuel for the various school houses of the city, including 25,000 tons of pea, were practically all based on circular prices. Where concessions were made the differences were slight. The dealers' bids for hauling were, however, much lower than anticipated, the competition being surprisingly keen. Whereas much of the hauling was done around $2 last year bids as low as $1.40 were received this season.

The big producing companies are quite optimistic as to the future for the large sizes. Their officers say the demand is sure to carry them through June and perhaps well into July. Undoubtedly the dealers will want to go into the fall with full stocks, so will continue to buy after all their orders on hand have been filled. We know quite a few dealers who intend to stock heavily on nut coal in place of pea, and will not altogether neglect this latter size either, but will store a much reduced tonnage of it.

It is believed that there will be many days this summer when the dealers will be out of certain sizes, for the demand from other territories for fuel is also very strong. The demand for family sizes is great from all districts, and while operators have made substantial shipments they are hopelessly short of the demand.

There is a fair demand for steam coals, but buckwheat is the only size that is really active. As it now stands, the production of this size is just about absorbed and no more. Rice, which has of late shown signs of improvement, has failed to hold it this week. At this writing there is actually more of this coal than the trade is able to take, and as a consequence a good tonnage is once more being sent into storage. Naturally barley has also failed to improve, and the piles of this size in the storage yards grow and are causing much anxiety to the companies.

The loss of broken coal tonnage has been general, as many of the gas companies have gone on coke. Some producers profess that this does not embarrass them, as they would rather break this size down and get better prices as family coal. It appears that the concerns most affected are those having a coal of a fragile nature which when broken down creates a heavy percentage of the extremely smaller sizes.

The prices per gross ton for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$5.95	$7.80	Buckwheat	$3.40	$4.45
Egg	5.95	7.80	Rice	2.75	3.65
Stove	6.20	8.05	Boiler	2.50	3.50
Nut	6.30	8.15	Barley	2.25	3.15
Pea	4.90	6.50			

Bituminous—The condition of soft coal is indifferent. There are some shippers who actually claim they are sold up, while others are making but very short time. Of course, as has been the case right along, the good coals find no difficulty whatever in making a market. A large proportion of this production continues to go into the New England market on contract orders.

Some shippers also report a more satisfactory condition as to contract inquiries recently, a number of fair-sized consumers having closed for their tonnages this past week. All concerns are still receiving many inquiries and more than a usual number have seemed to actually want coal lately.

There have practically been no price changes during the past week and they rule about as follows:

Georges Creek Big Vein	$2.90 @ $3.00
South Fork Miller Vein	2.90 @ 3.00
Clearfield (ordinary)	2.75 @ 2.90
Somerset (ordinary)	2.55 @ 2.70
Fairmont lump (ordinary)	2.40 @ 2.50
Fairmont mine-run	2.15 @ 2.25
Fairmont slack	1.90 @ 2.00

BALTIMORE

Soft-coal market uneventful, Fair prices maintained on best grades with cutting on other coals. Contract-making almost dead despite possibility of coal shortage. Hard coal men fairly busy.

Bituminous—There is no snap to the market here. What trading there is, is generally on a basis of fairly good prices for the best coal, with some sharp cutting at times on the less desirable grades. The nature of these sales, at prices considerably off the lowest rates offered on contract, is such that there is no general inducement for consumers to get under cover. For that reason the purchasing in the open market is about the only sign of activity.

Coal men are beginning to point out to their clientelé that the production of soft coal at this time is so far below consumption, and the distribution of mine labor has been so wide to other industries, that when the end of summer comes there may arise a situation where it will be difficult to make contracts to assure a fuel supply.

A feature of the market here is that the jobbers are planning for a vigorous business this fall. All the old clouds of Government regulation for jobbers, even to the point of their suppression, have gone, and the mines and consumers are both turning more than ever to the middlemen to help out. Several new names are noted in the coal-brokerage business, and none are apparently disappearing. The export movement was not so heavy last week. The total loadings on foreign coal cargo carriers was but 9349 tons, largely due to light reporting of bottoms at the piers.

Anthracite—The anthracite market continues fairly active. Dealers report that they are still delivering on orders received in April as the receipts from the mines did not enable them to put out in their hauls the tonnage they could otherwise have delivered. Some large anthracite contracts are now being made, as there is no advantage in holding off as in the cheaper spot market for soft coal. The city has awarded a contract for 15,230 tons for some municipal departments, to the Chesapeake Coal Co. for a total of $158,552.

Lake Markets

PITTSBURGH

Railroads buying coal steadily. Railroad coal price stabilization plan dead. Lake shipments of gas coal heavy. Market prices unchanged.

The idea still seems to survive in some quarters that there is a deadlock, or a near deadlock, in the matter of coal purchases by the railroads. The fact is that purchases are being made from day to day, at prices that seem equally satisfactory to the railroads and to the operators who make the bids. The coal price stabilization plan of the Industrial Board was tabled long ago, until it could be seen whether the Industrial Board could bring the Railroad Administration to an indorsement of the steel prices the steel producers had quoted, and with last week's positive and final failure of the steel producers and the Railroad Administration to get together, the coal plan died a natural death. Leading Pittsburgh coal operators had already practically forgotten it.

The railroads radiating from Pittsburgh are buying Pittsburgh district coal at various prices, according to quality, the highest price being the regular $2.35, which as reported last week was done on a contract for 1200 tons a day to Apr. 1, 1920, between the Pennsylvania Lines East and the Pittsburgh Coal Co. For shorter periods the railroads would be unwilling to pay as much, thus agreeing with the belief expressed by operators that coal prices will be higher next fall and winter than this spring and summer. The lowest prices paid have been for Panhandle coal, which in some cases is understood to have gone to railroads at less than $2.

The steel industry is consuming less and less coal each week. Its average operation was 65 per cent. of capacity in April, against 77 per cent. in March, and the rate this week is hardly above 55 per cent. Some other consuming industries, however, are expanding their operations somewhat.

Lake coal shipments have now reached important proportions, and in the case of high-grade gas coal there is almost a rush to get coal forward, in anticipation of possible transportation difficulties late in the season.

Production in the Pittsburgh district continues at about 50 per cent. capacity. The market remains quotable as follows:

Byproduct coal, largely nominal, mine-run, $2.35; high-grade gas coal, slack, $2.10@2.20; mine-run, $2.35; 3-in., $2.50@2.60; 1¼-in., $2.60@2.70; steam, slack, $1.90@2; mine-run, $2@2.35; all per net ton at mine, Pittsburgh district.

TORONTO

Rush of orders for hard coal continues. Dealers behind in deliveries. Shipments from mines light. Bituminous quiet. Industrial conditions unsettled.

There is a continued heavy demand for anthracite, consumers being anxious to lay in stocks before prices are raised. Shipments from the mines are light and supplies in the yards depleted. Dealers are considerably behind with deliveries, and new orders are only accepted subject to the price prevailing at the time of delivery. Bituminous is not much in requistion and dealers have ample stocks on hand. The industrial situation is considerably unsettled owing to extensive strikes in the metal and other trades, which have a tendency to further restrict the demand.

Quotations for short tons are as follows:

Retail:	
Anthracite, egg, stove, nut and grate	$11.50
Pea	10.00
Bituminous steam	8.25
Slack	7.25
Domestic lump	10.00
Cannel	11.50
Wholesale f.o.b. cars at destination:	
Three-quarter lump	6.00
Slack	4.75 to 5.00

BUFFALO

Small change in coal situation. Bituminous prices being cut. Anthracite in great demand. Lake shipments keep up fairly well in spite of complaints of scarcity.

Bituminous—Jobbers confess that trade does not improve, but continue their predictions of good business before long. Some of the districts, especially Ohio, are cutting slack prices. Some low figures are reported. Allegheny Valley, which was expected to be the first to reduce prices, claims that it is holding firmer than any other district. There was a shadow of car shortage, especially in grain and flour carriers, a short time ago, but that has about disappeared. Buffalo is loading 300 to 500 cars of grain a day for export. They can come back with coal, if needed, and thus relieve the open coal cars.

Bituminous prices are fairly strong, except slack, as follows: Thin-vein Allegheny Valley all grades but slack, $4.65; Pittsburgh and No. 8 lump, $4.45; same, mine run, $4.20; all slack $3.80, per net ton, f.o.b. Buffalo.

Anthracite—The heavy demand on the part of householders continues. Some days the distributors find it almost as heavy as it was during the big shortage. Egg has been especially scarce. An effort is made to keep up the lake shipments, though the local and rail demand would take it all if allowed to do so.

It looks as if the cellars will be well provided with supplies when the fall trade sets in. At the same time operators and shippers find it hard to keep up the supply.

The amount of anthracite loaded for the lakes for the week was 105,400 net tons, of which 23,700 tons cleared for Fort William, 19,500 tons for Milwaukee, 15,400 tons for Duluth and Superior, 14,100 tons for Chicago, 8500 tons for Hubbell, 7935 tons for Green Bay, 7000 tons for Waukegan, 3500 tons for Houghton, 2100 tons for Port Huron, 825 tons for the Sault.

Freight rates have been readjusted at 90c. to Port Huron, Sault, 52½-60c. to Chicago, 47½c. to Waukegan, Milwaukee, 42½c. to Duluth, Fort William, Hubbell, Portage, Marquette, Green Bay.

CLEVELAND

Virtually the only semblance of life in the local bituminous coal market is given by the lake trade. Steam-coal users are meeting spot needs only. The April movement of coal to Lake Erie ports was 30 per cent. ahead of April, 1918, but the May report may not be so favorable.

Bituminous—Coal operators here more and more are reaching the conviction that business is not being held up by the Peek-Hines controversy over steel-rail prices, but is awaiting the definite news that the Government has taken its hand off all business. The threat that Washington may at any time exercise the control within its power is said to be the underlying cause of the present dullness. Capital, naturally timid, will not bestir itself so long as the war powers of the President continue, is the statement. Whether the iron and steel industry, the largest single consumer of coal in northern Ohio, will gain anything like normal activity this summer, not to consider the fact that 1920 is a presidential year and history may be expected to repeat itself in presidential year dullness, is receiving serious consideration. The number of operators fearing subnormal conditions in the coal market for a period of at least months is growing fast. Operators are well agreed, however, that excessive production costs will serve to keep prices up regardless of slack demand.

With the lake trade taking mostly prepared sizes and very little slack, the piles of slack at eastern and southern Ohio mines become larger daily. Large buyers who have declared they would take slack again about the middle of May have made no move so far to make good their promise. Slack from $1.45 up is plentiful. Railroad fuel is moving at $2.10 and $2.15. Mine-run, which held at $2.35 during the war, now ranges as low as $1.90. The price of No. 8 3-in. lump for lake shipment continues to hold at $2.30 to $2.40.

Domestic consumers are showing a remarkable appetite for Pocahontas and anthracite, considering the holdover tonnage from last winter. The spur of advancing prices and the advertising campaign being carried on by the Pittsburgh Vein Operators' Association of Ohio has had a good effect upon the domestic trade, if not upon steam-coal buyers.

Lake Trade.—To May 1 Lake Erie car dumpers loaded 1,067,501 tons of bituminous coal for shipment to the upper lakes. Fuel coal handled in April amounted to 52,717 tons, making the grand total 1,120,218 tons. To May 1, 1918, the docks handled 860,797 tons of cargo coal and 30,249 tons of fuel coal, making the 1918 April total 891,046 tons. Duluth and Superior are said to have received 308,200 tons of bituminous and 78,500 tons of anthracite to May 1. Lake Erie docks are handling from 1700 to 1800 cars of bituminous a day now. Some carriers are coming down light for coal, so scarce are iron-ore cargoes. Many cargoes of coal loaded at Lake Erie ports are being held there pending an improved iron-ore market.

The following are coal prices in Cleveland, net ton delivered:

Anthracite:	
Egg	$10.85 to 10.95
Chestnut	11.15 to 11.25
Grate	10.95
Stove	11.05 to 11.15
Pocahontas:	
Forked	8.50 to 8.75
Lump	7.75 to 8.00
Mine-run	7.20
Domestic bituminous:	
West Virginia splint	7.05 to 7.15
No. 8 Pittsburgh	6.10 to 6.35
Massillon lump	7.15 to 7.25
Steam coal:	
No. 6 slack	4.30 to 4.40
No. 8 slack	4.70 to 4.85
Youghiogheny	4.90 to 5.10
No. 8 ¾-in. lump	5.35 to 5.50
No. 6 mine-run	4.40 to 4.50
No. 8 mine-run	4.70 to 4.85

DETROIT

Inactive demand and scattering sales of small size are features of the bituminous trade in the Detroit market.

Bituminous—Procrastination is seemingly the favored policy among Detroit buyers of steam or domestic coal of the bituminous type. Jobbers and wholesalers report business is unsatisfactory. The orders received are of small size and are coming in irregularly, in many instances suggesting that buyers are endeavoring to fill in temporarily, that they may be able to defer placing a larger business until a later period.

Unusually large stocks remaining in storage yards of the larger industrial plants and held by many of the retailers are said to be primarily the cause of the general indifference to bituminous coal, though among some of the buyers the unsettled general business outlook and a theory that prices may be lowered are also factors tending to delay placing orders.

Considerable of a reduction from Fuel Administration prices is apparent in quotations reported by some of the dealers as effective at the mines on short ton shipments. Splint or gas lump from West Virginia is quoted at $2.56 a ton, three-quarter lump $2.50, mine run $2.25, and slack $2, though prices are described as approximate. On Hocking lump the price is about $2.50, on mine run $2, and on slack about $1.50. Coal of good quality from other Ohio sections is said to carry about the same price. Smokeless lump and egg is scarce, and dealers are getting just about any price they place on it, while mine run of the same description brings about $2.75.

Anthracite—Domestic buyers are not coming into the market for anthracite as rapidly as dealers would desire, although warnings have been given repeatedly that prices will be higher to those who put off buying until later in the year. Most of the larger retail yards seem to have a comfortable supply of the prepared sizes, though receipts have not been of large proportions.

Lake Trade—Vessel managers are experiencing difficulty in obtaining cargoes for loading vessels for the downbound trip from the head of the lakes, with the result that a few carriers have been sent down without cargo to load coal. This, however, is regarded as unprofitable by the vessel-men. The cargo scarcity is having the effect also of delaying the start of numerous vessels which usually share in the coal trade and is the cause also of quite a number of vessels that have loaded coal being held in Lake Erie ports to await a brighter freight outlook.

COLUMBUS

There is a better feeling in the steam trade in Ohio territory. Inquiries are more numerous and some few contracts have been closed. Railroad contracts have also been announced. The domestic trade remains quiet, except for fancy grades.

The steam trade is now attracting the bulk of the attention of producers and shippers alike. While the price question is still unsettled, still there are some signs of an agreement between purchasers and sellers. Inquiries are more numerous, indicating that reserve stocks are being depleted and that purchasing agents will be in the market. Some of the larger users still have large surpluses, but in many cases it is of inferior coal and they are trying to buy some better fuel in order to mix with the poorer grades.

The demand for the small sizes is still slight, which is causing an oversupply of screenings. With the opening of the lake season that situation was not improved and, if anything, was made worse. Low prices are being asked for screenings and in some cases it has become a drag on the market. But taking it all in all, the steam trade is in slightly better shape than was the case several weeks ago and producers look for a continued improvement.

Railroad business has been booked around $1.90 and $1.95 for mine-run. A fairly large tonnage was purchased at those figures. This is expected to be a moral force to bring about general contracting as it has set price levels which are expected to maintain for some time. Some of the idle mines in the Hocking Valley and Pomeroy Bend have been opened, and this is proving an incentive to sales managers to hustle for business.

The lake trade is becoming more active, although there is no great movement as yet. Dock owners are shipping a larger part of the tonnage moving. Some lake agreements have been entered into with prices left blank, to be supplied when stabilized prices are arrived at. It is not believed that any great lake movement will develop before June 1.

Production has been slightly better in all of the producing fields of the state. This is especially true of the Hocking Valley and Pomeroy Bend fields, where the output is estimated at 40 per cent. of normal. Eastern Ohio is producing about 42 per cent. while Crooksville and Cambridge are credited with about 35 per cent. In mining sections there is a growing scarcity of labor, which is expected to become more acute as the season advances.

CINCINNATI

Market still quiet, though domestic demand is picking up. Stocks of smokeless coals running low. No contract activity.

The coal situation here is still quiet, although domestic demand increased somewhat during the past week. The trade in general, however, remains below normal. Prices were well maintained, and in some quarters the opinion prevails that prices will increase before the end of the summer season. There is a plentiful supply of bituminous coal on hand in this vicinity, but the smokeless grades are running low. In fact, the demand for smokeless coal is

much greater than the supply, and the local dealers are experiencing some little trouble in supplying the demand.

There is not much activity in contracting, dealers as well as consumers still remaining a little cautious. The local dealers are using every available means to get the consumer to buy, but so far have not been able to stir up any great amount of sales. They fear that this will result in a serious shortage when the buying begins, as it will again be a problem of transportation.

LOUISVILLE

Mines reporting fair domestic business, but dull steam demand. Retailers carrying fair stocks, but unable to develop spring stocking orders. Outlook for big fall rush at high prices.

The mines of Kentucky are operating on a fair percentage basis, but are short on orders for mine-run and nut and slack. A large part of the business has been on clean block coal. However, the retailers are rapidly loading up and are beginning to stop shipments, as they are unable to make deliveries and get rid of the surplus.

Railroads have been playing around considerably before placing contracts. The Louisville & Nashville has made most of its contracts for the season, but the Seaboard, Southern and other lines are still to be heard from.

Production in the mine sections is holding up very well, but are expecting duller movement if the retail situation does not change. Prices are firm and showing no change, although some steam coal is being quoted at under regular figures.

Quotations at mines:

	Eastern Kentucky	Western Kentucky
Block	$2.90@$3.25	$2.60
Egg	2.75@ 2.90	.....
Run-of-mine	2.35@ 2.40	2.35
Nut and slack	2.00	2.05

BIRMINGHAM

Buying of steam coal continues light, while movement to railroads has fallen off during past week. Domestic sizes about sold up through the year. Production shows a decline.

There is little inquiry or demand for steam fuel in this market, the accumulation of stocks in the hands of consumers still being sufficient to meet their restricted needs. There has also been a slump in the movment of contract coal, principally among the railroads, which are now taking about the minimum tonnage required in their agreements. Prices remain stable on basis of the Government schedules in effect as of Jan. 31, which are as follows per net ton mines:

	Mine-Run	Prepared	Screenings
Big Seam	$2.45	$2.75	$2.40
Black Creek and Cahaba	3.45	3.75	3.10
Corona, Pratt	2.85	3.05	2.45

Inquiry for domestic sizes has not slackened and there is a scarcity in this grade of fuel to meet present demand. Practically all sizes have been sold up through the remainder of the year and into the first quarter of 1919 in many instances. Prices are as follows per net ton mines:

Carbon Hill	$3.15
Corona	3.40
Big Seam	2.90
Black Creek and Cahaba	3.85@4.50
Montevallo	5.00

Operations at commercial and domestic mines are about on the same schedule as has been in effect for the past several weeks. Only a small percentage of the collieries of furnace companies are running, as iron production is at a very low ebb in this district. The Woodward Iron Co. is preparing to start up one or two stacks to supply some off-grade iron needed on contracts, which will necessitate an increased coal production from their mines.

Coke

CONNELLSVILLE

Prompt furnace coke stiffer still. Bottom about reached unless coal declines materially. Foundry coke demand improved.

The stiffening in the spot furnace coke market has continued. This represents in part the taking off the market of a few thousand tons of coke by a large coke and furnace interest which had labor trouble at its Vesta mine, and in part the closer djustment the coke operators have effected of production to contract requirements. Prompt coke, however, is still available at not above the $4 price commonly recognized in settling for May deliveries under contracts, and usually at somewhat less.

A considerable range of prices obtains on contract deliveries. Two or three contracts remain unadjusted at the old $6 Government price. The remaining contracts that had been written subject to "last Government price" were adjusted some time ago to $5, but it does not seem that further adjustments have been made. Contracts calling for monthly adjustment of price whenever Government control should be removed have been adjusted approximately as follows: February, $5; March, $4.50; April, $4.25; May, $4.

Any further decline in coke prices of any moment would depend on the coal market. If coal is maintained in the neighborhood of $2.35, furnace coke is hardly likely to go much below $4, as that price does not allow any profit for converting coal into coke.

There has been a distinct improvement in the demand for foundry coke, and particularly of the better grades. Very good grades are obtainable at $5, and it is held that it pays foundries to use such coke rather than the cokes that can be picked up at $4 and $4.25. The market is quotable as follows: Spot and prompt furnace, $3.75@4; spot and prompt foundry, $4.25@5, per net ton at ovens.

The "Courier" reports production in the Connellsville and Lower Connellsville region in the week ended May 3 at 133,606 tons, a decrease of 1756 tons.

Buffalo—The trade is still quiet, waiting for the iron movement to grow. It is believed that the time is not far off, but till it arrives it will not be easy to sell coke. Quotations, f.o.b. Buffalo, are $7 to $7.25 for 72-hour foundry, $6.60 for 48-hour furnace and $6.10 for off grades.

Middle Western

MILWAUKEE

The coal market continues quiet. Dealers urge consumers to buy and predict higher prices later on.

The coal market continues quiet, with only a fair demand. The announcement of the new scale of prices on May 1 elecited little comment, and it is evident that consumers fully realize that they are in for a continued period of high-priced fuel. The coal dealers have started a campaign of newspaper publicity in an endeavor to induce their customers to put in their supplies for next winter as early as possible, the prediction being advanced that prices will be higher later on. Coal cargoes are reaching port at the rate of three or four per day, the receipts from this source since the opening of navigation aggregating 113,303 tons of anthracite and 245,485 tons of bituminous. The Central Coal Co., which has not handled lake coal for several years, confining its business to Illinois rail coal, has received one cargo thus far over its dock. This company handles the fuel supply of the Chicago, Milwaukee & St. Paul Railway Co.

ST. LOUIS

An unusually quiet market with an impatiently waiting trade ready for the storage season, which it is hoped will soon open. No country demand for anything but a little anthracite, and the city steam and domestic is at a standstill.

The quietness that prevailed a few weeks ago is nothing compared to the unusual quietness that is prevalent now in the local trade. The only coal that is moving at all of domestic sizes is a little anthracite, which is going to a few dealers in the country. This is about the only thing that the country trade is calling for.

There seems to be an absolute shutdown of industrial plants outside of St. Louis, judging from the small amount of steam tonnage that is moving. The country trade never stores coal early and the result is that such coal as is moving is confined to St. Louis and one or two of the larger cities adjacent.

The steam business in St. Louis proper is at low ebb. There is so little demand that every time a buyer is in the market for a car or two of coal there are anywhere from 10 to 40 who are willing to cut the price a little under the previous price in order to get the business. The prices that were maintained a few weeks ago, which were to cover the cost of production in the Standard field, are utterly disregarded at the present time by the majority of operators. Coal is selling for far below cost of production, and how long this will continue is problematical.

The mines in the Standard field are working anywhere from one to three days a week. In the Mt. Olive field conditions are somewhat better and prices are pretty well maintained. In the Carterville field of Williamson and Franklin Counties, as well as in the Du Quoin field of Perry County, there has been some improvement the past week in the call for domestic sizes, this being mostly from points in the far north, evidently for storage purposes.

Steam sizes are in exceptionally good demand, all of the smaller sizes of nut and screenings bringing practically the top price for the better grades of coal.

The present prevailing prices per net ton f.o.b. mines are:

Williamson and Franklin County Association:		Mt. Olive and Staunton	Standard
Lump, egg and nut	$2.75	.....	.....
Washed Nos. 1 and 2 nut	2.85	.....	.....
Independent:			
Lump, egg and nut	2.55	$2.55	$2.00@2.25
Washed Nos. 1 and 2 nut	2.85	.....	.....
Mine-run	2.35	2.20	1.60@1.75
Screenings	2.20	2.05	1.15@1.30
3-in. lump	....	2.30	.....
2-in. lump	....	.....	1.75@1.90
2x6 egg	....	.....	1.85@2.00

Williamson-Franklin County rate to St. Louis is $1.07½; other rates $0.92½.

Coal and Coke Securities

New York Stock Exchange Closing Quotations May 12, 1919

STOCKS	Ticker Abvn.	Bid	Asked
American Coal Co. of Allegheny	(ACL)	45	...
Burns Brothers, Com	(BB)	150	151
Burns Brothers, Pfd	(BB)	99½	112
Central Coal & Coke, Com	(CK)	55	...
Central Coal & Coke, Pfd	(CK)	63	...
Colorado Fuel & Iron, Com	(CF)	44¾	45½
Colorado Fuel & Iron, Pfd	(CF)	...	122
Consolidation Coal of Maryland	(CGM)	75	...
Elk Horn Coal, Com	(EH)	29	30
Elk Horn Coal, Pfd	(EH)	...	47
Island Creek Coal, Com	(ICR)	39	...
Island Creek Coal, Pfd	(ICR)	75	...
Jefferson & Clearfield Coal & Iron, Pfd	(JF)	60	...
New Central Coal of West Va	(NCC)	5	...
Pittsburgh Coal, Com	(PC)	55	55¼
Pittsburgh Coal, Pfd	(PC)	87	88
Pond Creek Coal	(PD)	17	17½
Virginia Iron, Coal & Coke	(VK)	63	65

BONDS	Bid	Asked
Cahaba Coal, 1st Gtd. 6s, 1922	90	...
Clearfield Bituminous Coal, 1st 4s, Ser. A, 1940	71	...
Colorado Fuel & Iron, Gen. 5s, 1943	91	...
Colorado Indus. 1st Mtg. & Col. Tr. 5s, 1934	74½	74¾
Consolidation Coal of Maryland, 1st Ref. 5s, 1950	87	90½
Jefferson & Clearfield Coal & Iron, Sec. Mort. 5s, 1926	96	...
Lehigh Valley Coal, 1st Gtd. 5s, 1933	99½	101
Lehigh Valley Coal, Gtd. Int. Red. to 4%, 1933	79¼	...
Lehigh Val. Coal & Nav. Con. S. F., 4½s, Ser. A, 1954	90	...
Pleasant Valley Coal, 1st S. F. 5s, 1928	80½	...
Pocahontas Coal & Coke, Joint 4s, 1941	84	88
Pocahontas Con. Collieries, 1st S. F. 5s, 1957	88	88½
Roch. & Pitts. Coal & Ir., Helvetia Pur. Money 5s, 1946	98	...
St. L., Rocky Mnt. & Pac. Stamped 5s, 1955	80	83
Tenn. Coal, Iron & R.R., Gen. 5s, 1951	91½	92½
Utah Fuel, 1st Sinking Fund 5s, 1931	87	...
Victor Fuel, 1st Mtg. Sinking Fund 5s, 1953	55	70
Virginia Iron, Coal & Coke 1st 5s, 1949	85½	85¾